EXHIBIT 27

UNITED STATES DISTRICT COURT
DISTRICT OF MINNESOTA

In Re: Bair Hugger Forced Air Warming Products Liability Litigation	)	
This Document Relates To:	)	
All Actions.	)	MDL No. 15-2666 (JNE/FLN)

VIDEOTAPED DEPOSITION OF SAID ELGHOBASHI
Newport Beach, California
Thursday, June 15, 2017

Reported by:
ELIZABETH BORRELLI, CSR No. 7844, CCRR, CLR
JOB NO. 124785

Videotaped Deposition of SAID ELGHOBASHI, Volume I, taken on behalf of the 3M, at 4675 MacArthur Court, Suite 1250, Newport Beach, California, commencing at 11:32 a.m., Thursday, June 15, 2017, before Elizabeth Borrelli, a Certified Shorthand Reporter in the State of California, License No. 7844.

* * *

APPEARANCES OF COUNSEL:

For the Plaintiff:

ANDREWS THORNTON HIGGINS RAZMARA
BY: ANNE ANDREWS
BY: JOHN THORNTON
Attorney at Law
2 Corporate Park
Irvine, California 92606

- AND -

MESHBESHER & SPENCE
BY: GENEVIEVE ZIMMERMAN
Attorney at Law
1616 Park Avenue
Minneapolis, Minnesota 55404

- AND -

KENNEDY HODGES
BY: GABRIEL ASSAAD
Attorney at Law
4409 Montrose Boulevard

Houston, Texas 77006

For Defendants:

BLACKWELL BURKE
COREY GORDON
431 South Seventh Street
Minneapolis, Minnesota 55415

Also Present:

Michael Mullin, videographer

I N D E X

EXHIBITS

Exhibit 18 Expert report by Dr. John Abraham in re 3M Bair Hugger, 33 pages 150

INFORMATION REQUESTED
(None)
UNANSWERED QUESTIONS
(None)

LOS ANGELES, CALIFORNIA; THURSDAY, JUNE 15, 2017
11:32 A.M.

THE VIDEOGRAPHER: Good morning. We are now on the video record. The following is the videotaped deposition of Said Elghobashi in the matter of Bair Hugger Forced Air Warming Products Liability Litigation, which is filed in the United States District Court for the District of Minnesota, Case No. 15-2666.

This deposition is being held at Dentons US, LLP, 4675 MacArthur Court, Suite 1250, in Newport Beach, California. Today's date is Thursday, June 15th, 2016 [sic]. The time now is 11:32 a.m.

My name is Michael Mullin from TSG Reporting. The court reporter is Liz Borrelli. All counsel will be noted on the stenographic record.

Will the court reporter please swear in the witness.

SAID ELGHOBASHI,
having been duly administered
an oath in accordance with CCP 2094,
was examined and testified as follows:

THE REPORTER: I think counsel wanted to

state their appearances on the record.

MS. ANDREWS: Yes. So my name is Anne Andrews, Andrews Thornton Higgins & Razmara. I'm a member of the plaintiffs' executive committee in this matter. To my right.

MR. THORNTON: John Thornton.

MR. ASSAAD: Gabriel Assaad from Kennedy Hodges.

MS. ZIMMERMAN: And Genevieve Zimmerman from Meshbescher & Spence.

MS. ANDREWS: Counsel?

MR. GORDON: Corey Gordon on behalf of 3M and Arizent and --

MS. ANDREWS: And, sir?

MR. GORDON: -- with me is Professor John Abraham.

MS. ANDREWS: So Mr. Abraham -- Professor Abraham, are you a -- a witness in this proceeding?

MR. ABRAHAM: I am one of the expert witnesses on the defense.

MS. ANDREWS: So you're appearing here on behalf of 3M; is that correct?

MR. ABRAHAM: Correct.

MS. ANDREWS: Are you going to be giving any testimony or asking any que- -- questions here

today?

MR. GORDON: Cou- -- Counsel, this is -- this is not Professor Abraham's deposition. He's here to assist me. If you have any questions about --

MS. ANDREWS: Well --

MR. GORDON: -- his -- his presence here --

MS. ANDREWS: -- I do.

MR. GORDON: -- you can ask me about it.

MS. ANDREWS: Fair enough. I do. So I just want to be sure that everyone -- it's -- it's unusual for other people to be present at such a proceeding. This will be, from what I understand, a confidential proceeding. You will ask for confidential. The parties have agreed to confidentiality at the end of the proceeding, so --

MR. GORDON: Professor Abraham has signed the confidentiality --

MS. ANDREWS: So I'd like --

MR. GORDON: -- order.

MS. ANDREWS: I'd like an assurance that the professor has signed a confidentiality agreement because there will be proprietary information.

MR. GORDON: You just got it.

MS. ANDREWS: Okay. I have a few more things to remind Mr. -- counsel and -- and Professor Abraham about that --

MR. GORDON: No, actually, Counsel, this is my deposition. So if you want to -- you want to take time --

MS. ANDREWS: These are really simple admonitions, Counsel. Everybody knows what the rules are. We have an -- we have someone here who is not a member of our bar, who is not admitted in this case.

MR. GORDON: And -- and -- and I'm responsible for his presence here.

MS. ANDREWS: That's exactly --

MR. GORDON: I will -- and I will be responsible for --

MS. ANDREWS: That's exactly what I wanted --

MR. GORDON: -- what he does and doesn't do at this deposition. He doesn't need --

MS. ANDREWS: That's exactly what I wanted to remind you of.

MR. GORDON: -- to be lectured by you --

MS. ANDREWS: If he --

MR. GORDON: -- and I don't need to be

lectured by you.

THE REPORTER: Counsel.

MS. ANDREWS: You are not being lectured by me. You are being advised --

MR. GORDON: Okay.

MS. ANDREWS: -- that everyone in this --

MR. GORDON: I want to move on with this deposition. If -- and you said you -- before, you said would wait --

MS. ANDREWS: If you are responsible for his -- for his being here today, you're also responsible for his conduct, which means that he is to conduct himself in the matter of these proceedings --

MR. GORDON: Counsel --

MS. ANDREWS: -- as if we were in court.

MR. GORDON: I've been practicing law for 37 years.

MS. ANDREWS: So have I.

MR. GORDON: I kind of -- kind of understand the rules.

MS. ANDREWS: I do too.

MR. GORDON: So let's go ahead. I don't want to impose on Professor Elghobashi any more than is necessary.

MS. ANDREWS: That's very kind of you, but I -- we're -- we are making a record for the Court to be sure that no one acts in an improper fashion, and that's -- that is highly important to us and to you, and no one -- no one violates a protective order entered by a federal judge in this matter.

So we're all on the same page; is that correct, sir?

MR. GORDON: I'm prepared to go forward with the deposition, and --

MS. ANDREWS: So I am too.

MR. GORDON: Okay.

MS. ANDREWS: So but the first order --

MR. GORDON: You -- you -- you've said -- you've -- you've had your time to make your record. You've made your record.

MS. ANDREWS: Thank you, sir. So the next --

MR. GORDON: Let's -- let's --

MS. ANDREWS: So the next item of business is the response to your subpoena. I'm prepared to produce the documents that you have served a formal subpoena in this case. Would you like to proceed, sir? We have the notice.

MR. GORDON: I -- I mean, yeah, I've been

wanting to proceed for several minutes now.

MS. ANDREWS: We have the notice.

MR. GORDON: Great.

MS. ANDREWS: Would you like to attach a copy of it to the record or shall I?

MR. GORDON: I'm -- I'm going to see how I -- how -- how things go. I don't want to make a decision until I've -- if you want to produce some records that he --

MS. ANDREWS: Well, if you don't want the documents I have --

MR. GORDON: No, give the -- give me the documents.

[Reporter requests attorneys speak one at a time.]

MS. ANDREWS: All right. So we received a subpoena. Apparently, counsel will attach it if he so chooses, a copy of the subpoena signed by Deborah Lewis in the matter served on Dr. Elghobashi with a attachment, items No. 1 through 20 as follows. So we have a response to all the items for your subpoena, and we'd like to give them to you and attach them formally to the record at this time.

Item No. 1, Item No. 1 is the documents meeting this request were previously produced on

6/12 when we sent to defendants a Dropbox links -- a Dropbox link with the following documents: The CAD files, the papers or reports cited in the Rule 26 report and Dr. Elghobashi's custody simulated human skin scales from -- from the Lees and Brighton article entitled "Simulated Human Skin Scales," 1972, photographs of drapes of the operating room, and the errata sheet.

Did you receive those documents, sir?

MR. GORDON: You know what? Counsel, when you're done making your record, why don't you let me know and I'll come back in.

MS. ANDREWS: Did you receive the CAD files --

MR. GORDON: I'm not under a --

MS. ANDREWS: -- we sent to you?

MR. GORDON: I'm not here to be deposed by you. I'm not here to have this deposition taken over by you.

MS. ANDREWS: Fair enough. So when --

MR. GORDON: When you're done with --

MS. ANDREWS: You can --

MR. GORDON: -- making your record and you can pay the court reporter for the transcript of --

MS. ANDREWS: You can le- -- you can leave

if you want --

MR. GORDON: -- whatever it is you do --

MS. ANDREWS: -- but it seems kind of silly since I'm going to hand you the documents that you requested.

MR. GORDON: No, what you're doing is silly.

[Reporter requests attorneys speak one at a time.]

MS. ANDREWS: All right. So Exhibit No. 1 --

MR. GORDON: Excuse me.

MS. ANDREWS: -- to the attachment is being produced. The -- the Humulate -- the "Simulated Human Skin Scales" is No. 1. It will be Exhibit No. 1 that we've produced pursuant to the subpoena, the formal subpoena in this case.

No. 1B --

MR. GORDON: Let me know when you're ready to con- -- begin your deposition.

(Whereupon Mr. Gordon left the deposition proceedings at this point in time.)

MS. ANDREWS: -- is the deposition request for four photographs. If you want to mark these.

THE REPORTER: I'll wait.

MS. ANDREWS: You probably shouldn't because there are going to be a lot.

THE REPORTER: I don't have the exhibit stickers, ma'am. Can we go off the record?

MR. ASSAAD: Sure.

MS. ANDREWS: Do you need exhibit -- exhibit stickers?

THE REPORTER: I need to go off the record.

MS. ANDREWS: Why do you need to go off the record?

THE REPORTER: Can you go off the record or do I have to --

MS. ANDREWS: No, I get to say when you go off the record. Why do you need to go off the record?

THE REPORTER: Okay. I'm -- I'm going off the record. You can be on the video record. I'm going off the official record.

(Off the official record.)

(Whereupon the court reporter left the deposition proceedings at this point in time.)

(Whereupon the court reporter entered

the deposition proceedings at this point in time and the official record was resumed.)

MS. ANDREWS: So make that 1.

(Whereupon Mr. Gordon entered the deposition proceedings at this point in time.)

(Discussion off the record.)

THE REPORTER: Counsel, I have given her the exhibit stickers --

MR. GORDON: No.

THE REPORTER: -- because she wanted to mark --

MS. ANDREWS: Thank you very much.

THE REPORTER: -- the exhibit.

MR. GORDON: I'm sorry. This is my deposition. You're not going to take -- be marking exhibits during my examination. When I'm finished, if you want to mark exhibits, if you want to conduct your own direct examination, that's what the rules permit. You're not taking over my deposition.

MS. ANDREWS: Counsel, you issued a subpoena in this case.

MR. GORDON: So fine. Give me the --

MS. ANDREWS: And I have giving you --

MR. GORDON: Give me documents and let me move on.
MS. ANDREWS: -- the documents. I am giving them to you, is exactly what I'm doing.
MR. GORDON: But I'm --
MS. ANDREWS: You're --
MR. GORDON: -- you're not going to mark them as --
MS. ANDREWS: -- somehow not happy.
MR. GORDON: -- exhibits during my deposition. You can mark them during yours -- your -- your portion. If I choose to mark them, I'll mark them --
MS. ANDREWS: Fine.
MR. GORDON: -- in the order that I want to mark them.
MS. ANDREWS: We won't give them to you then. We will hou- -- we will attached them exhibits at the end of the deposition, so...
MR. GORDON: No, we -- you --
MS. ANDREWS: I don't know how to make you happy, sir.
MR. GORDON: Just give me the --
MS. ANDREWS: I've never done a deposition with you.

MR. GORDON: Give me the documents.
MS. ANDREWS: I am entitled, sir, to make a record of what I've produced here today. It's very simple.
MR. GORDON: Yes, fine. You can make the --
MS. ANDREWS: Your hostility is very out of line.
MR. GORDON: You can make the record when it's your -- when it's your turn.
MS. ANDREWS: It's just a record of giving you the documents that you requested.
MR. GORDON: It --
MS. ANDREWS: This is done all the time.
MR. GORDON: I -- well, okay. I'm -- I -- I must have just missed it.
MS. ANDREWS: No.
MR. GORDON: I've never had --
MS. ANDREWS: Can you just be resp- -- be reasonable that I'm trying to respond? I have a -- I have a half a foot of documents here to hand you, and I'm trying to do it in a fashion that's responsive to a federal subpoena, and you won't -- don't appear to be -- to want me to.
MR. GORDON: And -- and that's fine. You

can --
MS. ANDREWS: So I'll sit back --
MR. GORDON: -- hand me the documents.
MS. ANDREWS: No, I'm not handing them to you. I'm going to make a record that I did give what I gave to you. This is a very complicated case with a lot of files that I want -- I've asked you if you received files that we sent you. You had no response for me. It's a courtesy and a -- and a -- and customary that we be professional to each other in giving each other subpoenaed documents and make a record so that everyone knows we came here prepared --
MR. GORDON: I -- I --
MS. ANDREWS: -- to give you.
MR. GORDON: I'm -- I'm prepared to accept that your representation that the stack of documents you have are responsive to the subpoena.
MS. ANDREWS: That's fine, but that's not how I'm going to offer them. So you start the deposition, sir, and then we'll come to these when you feel --
MR. GORDON: No, the --
MS. ANDREWS: -- like you want them.
MR. GORDON: The subpoena calls for the

production of the documents before the deposition. Before -- before my examination. I want the documents. If you --
MS. ANDREWS: If you -- no, you do want them now. You just don't want me to mark them.
MR. GORDON: I -- that's right. I don't want you to choose how -- how and where to mark --
MS. ANDREWS: Okay.
MR. GORDON: -- exhibits in this portion of the deposition.
MS. ANDREWS: Okay.
MR. GORDON: If you want to read into the record what you're -- what you're producing to me, I'll -- you know, that's fine. You're an officer --
MS. ANDREWS: Will you --
MR. GORDON: -- of the Court.
MS. ANDREWS: Will you stay here for that part of the reading instead of walking out in the middle of my trying to give you a record of what I've given you? Will you -- will you remain in the deposition, sir --
MR. GORDON: I --
MS. ANDREWS: -- while I comply with your subpoena?
MR. GORDON: If you want to just go

through and explain what -- what's in each folder and how -- that's fine.

MS. ANDREWS: That's what I intended to do.

MR. GORDON: Okay. Well, you were doing a lot more than that.

MR. THORNTON: And we have the perfect right to mark anything we give you --

MR. ASSAAD: Just -- just -- just mark it as --

MR. THORNTON: -- for the record. I'm going to -- there's no reason to quabble here.

MS. ANDREWS: It's a simple way to mark them, unless you want me to hand them -- hold them up to the video and so we have a video record of everything I gave you. It's really not that contentious. I'm sorry if you -- if you're offended by it. So --

MR. GORDON: Well, if it's not that contentious, why aren't you just giving me the documents like --

MS. ANDREWS: I explained myself.

MR. GORDON: -- everybody else gives?

MS. ANDREWS: I explained -- I explained myself to you. I'm not everybody else. I'm here

today answering a federal subpoena and marking documents at -- for the record to be sure that we understand what we gave you. There were 20 requests on an attachment to this federal subpoena. You recall that, correct, sir?

MR. GORDON: Uh-huh.

MS. ANDREWS: So we're giving you the attachments, the -- the response to the documents that you asked for. Do you --

MR. GORDON: I -- I accept that. Let's go --

MS. ANDREWS: Okay. So --

MR. GORDON: Let's move on.

MS. ANDREWS: Okay. So we're moving on. Here are the photographs.

MR. THORNTON: Let -- let him choose to -- how he wants to indenti- --

[Reporter requests clarification.]

MR. THORNTON: Let counsel decide how he wants -- when he wants them, we can mark them.

MS. ANDREWS: I'm going to mark them if you want them now, so it's your choice.

MR. GORDON: What do you mean by mark them?

MS. ANDREWS: That they are exhibits to

the deposition that can be read and understood at the deposition that we produced them today contemporaneous with the deposition in response to your subpoena.

MR. GORDON: I -- I -- I --

MS. ANDREWS: It's what the law requires.

MR. GORDON: You can mark them as exhibits if you want during your portion.

MS. ANDREWS: That's fine. Then he's not -- then I'm not going to give them to you because I -- I have to mark them.

MR. GORDON: Oh, come on, Counsel. This is ridiculous.

MR. THORNTON: You don't just hand over a bunch of documents willy-nilly and say --

MR. GORDON: Really?

MR. THORNTON: -- these are responsive. That's -- they -- they get -- they get -- there's certain responses to certain filings.

MR. GORDON: Well, when you e-mailed the file on Monday, was that willy-nilly? I -- I don't -- what are -- what are you talking about?

MR. THORNTON: It was in response to request No. 1. We didn't have a way to mark it because it was a computer file, but we -- we'll note

it.

[Reporter requests clarification.]

MR. THORNTON: We will note it, yeah, sure. That's part of the response to Exhibit 1 as well. I mean, if -- if this is a stylistic problem, I -- I understand, but why don't you go ahead with your deposition any way you want to take it. It's --

MR. GORDON: We -- we asked for production of documents you've got. We -- we've subpoenaed them. You've got the documents. I have -- I understand you want to make a record that you're complying with the subpoena. That's fine. You know, maybe in California --

MR. THORNTON: We just want to identify the --

MR. GORDON: -- people challen- -- challenge that --

MR. THORNTON: -- documents --

MR. GORDON: -- but, you know, we're -- we're --

MR. THORNTON: -- that we're producing so there is a record of what we're producing and what it's in response to.

MR. GORDON: Right, but that -- I don't

know that -- you know, that they necessarily need to be exhibits to a deposition that then becomes something that we have to pay to -- to photocopy and it becomes part of a voluminous --

MR. ASSAAD: Well, we'll just distinguish and say the Plaintiff's Exhibit 1 to a subpoena and you could go as Defense exhibits and start at 1 as well.

MR. GORDON: That's a good idea. You mean, like, a group exhibit?

MR. ASSAAD: No. Just, like, this is Plaintiff's Exhibit 1, 2, 3, 4, and then -- then you can start off with --

MR. GORDON: We're not -- we -- we haven't been doing Plaintiff's and Defense exhibits. But you know what? Just go ahead mark them. I -- I just want to move this on.

MS. ANDREWS: I think you'll --

MR. GORDON: I think this is ridiculous.

MS. ANDREWS: I think you'll appreciate what I'm trying to support here --

MR. GORDON: Yeah, I think --

MS. ANDREWS: -- with your subpoena and my responses at the end of the case.

So, as I previously mentioned -- let's

start over again. I don't know where the court reporter ended. So 1A is a copy of an article in response to -- to request No. 1 entitled "Simulated human skin sales -- skin scales" by Julienne Lees and W. D. Brighton.

Can you mark this?

MR. ASSAAD: Sure. Do you want a sticker?

MR. THORNTON: You know, I'm just going to mark it with a pen --

MS. ANDREWS: That's fine.

MR. THORNTON: -- as part of Exhibit 1.

(Whereupon Exhibit 1A was marked for identification.)

MS. ANDREWS: And I'm going to hand our copies back to you, Jen.

So now 1B -- you gotta mark that 1A.

MR. THORNTON: Okay.

MS. ANDREWS: So this is all response to No. 1.

1B is four photographs requested by No. 1.

(Whereupon Exhibit 1B was marked for identification.)

MS. ANDREWS: It's 1C.

Jen, if you'll just keep them in order down there.

MS. ZIMMERMAN: Thank you.

MS. ANDREWS: Okay.

MR. THORNTON: 1C is entitled "Corrections of Typographical Errors."

(Whereupon Exhibit 1C was marked for identification.)

MR. THORNTON: 1D is entitled "Summary of data 2010-011 versus 2010-026."

(Whereupon Exhibit 1D was marked for identification.)

MR. ASSAAD: If you go by Bates numbers.

MR. THORNTON: And the Bates Nos. 3M00075103 and 104.

MS. ANDREWS: Thank you.

Response to Request No. 2, there are no responsive documents to Request No. 2.

Response to Request No. 3, there are no responsive documents to Request No. 3.

Request No. 4, there are no responsive documents to Request No. 4.

Request No. 5, there are no responsive documents to Request No. 5.

Request No. 6, deponent CV contains the list of publications. Attached is a copy of deponent's CV.

MR. THORNTON: Is that 6?

MS. ANDREWS: 6?

MR. THORNTON: Or we want to keep it in correspondence with the depo notice and call it 6?

MR. ASSAAD: Yeah.

(Whereupon Exhibit 6 was marked for identification.)

MS. ANDREWS: I'm handing a copy of the -- of the deponent's current CV.

Request number seven 7, objection. Overbroad and ambiguous as to the terms the deponent considers authoritative. And with regards to the deponent's opinions in the case, documents relied upon have been produced without waiving the objection. Documents relied upon have been produced. Documents that are responsive may be referenced in the Rule 26 report. And such documents, if in the witness' possessions, have been produced. See Response 1.

Request No. 8, a copy of deponent's CV is attached.

Request No. 9... No. 9, we're attaching --

MR. THORNTON: And I'll -- I'll --

MS. ANDREWS: Yeah, put them in order.

MR. THORNTON: Thank you.
MS. ANDREWS: We have a number of documents that are responsive to Request No. 9.
MR. THORNTON: So I'll put 9A. Dated -- a transmittal, May 14th, 2016.
(Whereupon Exhibit 9A was marked for identification.)
MS. ANDREWS: And attachment exhibit, check.
MR. THORNTON: 9B, a transmittal, September 20th, 2016.
(Whereupon Exhibit 9B was marked for identification.)
MR. THORNTON: 9C, a transmittal, March 26th, 2017.
(Whereupon Exhibit 9C was marked for identification.)
MS. ANDREWS: Put them in order.
MR. THORNTON: 9D.
MR. ASSAAD: Is that the same -- it's not the same?
MR. THORNTON: August -- same -- same thing, March --
MS. ANDREWS: 14, 20, 26.
MR. THORNTON: Okay. And then a -- I

think this is an aggregate exhibit, yes. 9D. We're on D, right?
(Whereupon Exhibit 9D was marked for identification.)
MS. ANDREWS: Very good.
MR. THORNTON: And that's it.
THE REPORTER: Sir, Mr. Assaad, I'm having trouble hearing you.
MR. ASSAAD: I'm sorry.
THE REPORTER: Do you want it off the record?
MR. ASSAAD: Yeah, that was just a communication between counsel.
9D is a aggregation of bills. I think those are Bates'd.
MS. ANDREWS: Let me just look at them.
Okay. Documents in respo- -- in response to Request No. 9, retention bills.
Request No. 10, same response. Same documents as No. 9.
No. 11, there are no responsive documents to this request.
No. 12, there are no responsive documents to this request.
No. 13, there are no responsive documents

to this request.
No. 14, there are no responsive documents to this request.
No. 15, there are no responsive documents to this request.
No. 16, there are no responsive documents to this request.
17, there are no responsive documents to this request.
18, the response is report and all materials contained in the report.
Request No. 19, there are no responsive documents to this request.
No. 20, the response to Request No. 20 is all nonproprietary information has been furnished.
(Discussion off the record.)
MS. ANDREWS: I did, yes.
The only other thing that we were hoping to ask counsel about that pertains to this proceeding is that Ms. Zimmerman informs me that as recently as yesterday, the Court entered an order regarding rebuttal reports. So we want the record to reflect that we will be rebutting at trial a -- numerous reports that have been served on the plaintiffs. Just so it's abundantly clear, there

will be no rebuttal reports. So, for instance, Dr. Abra- -- Abraham's report, who is present here today, will be rebutted in testimony at trial, as where -- as well as a number of other experts that we can't identify at this time.
MS. ZIMMERMAN: Just to clarify for the record, the hearing was this morning in Minneapolis. I think it started at 9:30 Central. I don't know if an order has officially been entered, but the judge ruled from the bench that the ability to rebut will be preserved for trial.
Finally, one other issue is that to the extent that the subpoena calls for any exhibits that will be used at trial, the plaintiffs will just formally object to that and reserve the right to identify any exhibits, including demonstratives, in connection with the Court's forthcoming scheduling order.
MS. ANDREWS: So that completes the response to your subpoena, sir, and comments for the record about reports, et cetera. And the witness has been sworn.
MR. GORDON: I'm -- am I missing something here on your 9?
MS. ANDREWS: I hope not. Let me see.

MR. GORDON: A, B, C. It looks like there's a gap between September 2016 and February 2017.

MS. ANDREWS: Why don't you hand them back. Let me look at them. Let me hand them to Ms. Zimmerman.

Is everybody okay with the temperature in here? It feels like it's going to get warm. Are you okay?

THE REPORTER: I'm beginning to get cold, so hopefully we don't have to --

MS. ANDREWS: It's usually hot on that end, because all the equipment's there.

THE WITNESS: Yeah.

MS. ANDREWS: So just let me know, Doctor --

THE WITNESS: Sure. Sure.

MS. ANDREWS: -- if you're --

THE WITNESS: Sure.

MS. ANDREWS: -- uncomfortable.

THE WITNESS: Sure. Thank you.

MS. ZIMMERMAN: Counsel, to the extent it -- I -- it seems that there may be -- we -- we have searched our records and these are the invoices that we have, and we've produced all checks that

have been provided. So I believe that this is complete, but we are happy to reexamine the issue. There are checks as -- if you look in 9D, that are dated in the fall of 2016, if that's the gap that you -- I think you may have identified.

MR. GORDON: Well, yeah. I mean, I just -- so there are no -- there was no work done between September 19th, 2016, and February 8th, 2017?

MS. ZIMMERMAN: No, that's not -- that's not what I said. But the invoices that have been provided have been -- or have been submitted to counsel have been reimbursed and they have been provided to counsel in connection with the subpoena.

MR. GORDON: Okay. But I'm not asking about -- about the checks. There -- you've -- you've produced three invoices. One that says it covers the period from April 3rd, 2016, to May 14th, 2016. Then one from -- well, I guess there are a couple of gaps. Then one from July 23rd, 2016, to September 19th, 2016. And another one from February 8th, 2017, to March 23rd, 2017.

MS. ANDREWS: Can I make a suggestion?

MR. GORDON: Yeah.

MS. ANDREWS: Let's -- let's maybe handle

this at a break and we'll go through them carefully and see if there's any gaps and any more information that might be missing. We just produced the file that was sent to us, sir, so I apologize if there are gaps, but we're happen to be compliant with the subpoena request, and I think we just have our of -- off-the-record discussion about it.

MR. GORDON: Well, I -- actually, Counsel, you've kind of convinced me how important it is to have things on the record when it comes to responding to subpoenas.

MS. ANDREWS: It's your choice.

MR. GORDON: There's a check --

MS. ANDREWS: It's your choice, Counsel.

MR. GORDON: Well, there's a --

MS. ANDREWS: You wanted it off the record before.

MR. GORDON: There's a check --

MS. ANDREWS: Now you want it on the record.

MR. GORDON: Yeah. There's a --

MS. ANDREWS: Have it your way.

MR. GORDON: Yeah. There's a check attached to each one of these three invoices that I just referenced, but then there's a stack of four

checks, each bearing different dates, but each for the amount of $32,500, so that's -- that's a total of $130,000. And there are -- there are no -- there's no corresponding invoice. There's nothing that -- from which I can examine Dr. Elghobashi about, what this 160 --

MS. ANDREWS: Well, you have the witness here before you who --

MR. GORDON: -- 130,000 is for.

MS. ANDREWS: -- who sent the invoices.

[Reporter requests attorneys speak one at a time.]

MS. ANDREWS: I apologize. The witness is here who produced -- provided the invoices, so perhaps he can shed some light on it if you choose to inquire. I don't think counsel --

MR. GORDON: So you're --

MS. ANDREWS: -- can do anything more for you today.

MR. GORDON: Okay. I just want -- you're -- so you're representing that these three invoices marked 9A, 9B and 9C are the only invoices you have?

MS. ANDREWS: That's what I've been given to -- in response to the subpoena, sir.

MR. GORDON: By whom?

MS. ANDREWS: By the custodian of those files. And I'm not -- my deposition isn't going forward today --

MR. GORDON: Well, I --

MS. ANDREWS: -- either. I --

MR. GORDON: -- I didn't mean --

MS. ANDREWS: -- asked for them from the committee. This is what I received. This is what I went on the record to give to you today. So if you have questions of the witness and not of counsel, I'll be happy to have him answer any questions about it.

MR. GORDON: Well, I'm just trying to understand who responded to this subpoena. Is this Dr. Elghobashi provided the -- these responses, or did somebody else on the plaintiff's steering committee provide these responses?

MS. ANDREWS: I don't think that's a question that I can answer for you, sir.

MR. GORDON: You can't answer -- you've just gone through an elaborate thing to tell me about everything you're producing, but you can't even tell me where the documents you're producing came from?

MS. ANDREWS: I don't think that I have a

responsibility to answer your questions. I've done the best I can responding to your subpoena. You have the documents. Go forward, sir.

MR. GORDON: Got it.

EXAMINATION

BY MR. GORDON:

Q. Okay. Let's start.

Good morning --

A. Good morning.

Q. -- Dr. Elghobashi. And it is basic- -- just still morning. I apologize for all the back and forth there.

You, sir, have never had your deposition taken before?

A. Never.

Q. Okay.

A. It's a new experience.

Q. I'm sure it's one you're going to want to relive over and over again and do it -- do as often as you possibly can.

If you need to take a break for any reason --

A. Sure.

Q. -- just, you know, say so and --

A. Thank you.

Q. Everything you say is being transcribed by the court reporter.

A. Sure.

Q. It's also being videotaped. Because of that, there's a -- there's sort of an artificial communication --

A. Okay.

Q. -- limitation.

A. Sure.

Q. When people talk, we -- we tend to talk --

A. Okay.

Q. -- over each other. I have to wait until you're done with your answer. You need to wait until I'm done with my question. If Ms. Andrews offers a -- an objection, we both have to wait until she has completed her objection. That's more for the court reporter.

A. Sure.

Q. She -- she can't take down two people talking at once.

The other big rule, and it makes it sort of un- -- different than normal human conversation, is you have to give clear verbal answers like "yes," "no." Not "uh-huh," "uh-uh," or a shake or nod of the head. "Uh-huh" or "uh-uh" or a shake or a nod

of the head will communicate to me, and I'll probably understand what you're saying. She just can't trun- -- transcribe it. So there's -- I just -- with that background of artificiality, I just want -- want -- want you to be aware of that.

If you don't understand a question that I ask or don't hear it or don't hear part of it, please let me know and -- so we can make sure that the -- the question is clear to you. Okay?

A. Sure.

Q. Okay. When -- you -- you're a professor at University of California at Irvine?

A. Correct.

Q. And are you -- I'm sorry. Are you professor or professor emeritus? You're still --

A. I'm still.

Q. Still active. Okay. But you -- you've been there for quite a while, right?

A. Correct.

Q. I don't mean to imply that you're old, I'm just --

A. I am old.

Q. Yeah, so am I. It happens.

The -- and your -- your particular area of -- of expertise is computational fluid dynamics;

Page 42

is that correct?
A. Correct.
Q. Okay. Something you've been doing for several decades, right?
A. Correct.
Q. Okay. When were you first contacted about participating in this litigation as a -- as an expert witness?
A. In July 2016.
Q. Well, let's -- you know what? Let's start with these invoices and see if we can clear up my confusion. Let me show you what your -- what's already been marked helpfully as Exhibit 9A. And this looks like an invoice from you from May 14th, 2016, covering April 3rd to May 14th, 2016.
A. I have to get my glasses. I'm sorry. I didn't know I was going to read.
Yes.
Q. Okay. So that appears to be before July 2016, so it's --
A. Right, yes. I meant we met in July, but I was approached before, of course. May -- let's see here. So it would be -- I don't recall. Maybe April or something.
Q. Okay. And so you -- the first contact

Page 43

would have been --
A. For April -- let's just say April 3, yes. It's written here, April 3.
Q. And you were called; is that right?
A. Correct.
Q. And -- and what -- you know, what -- what is it you under -- you were asked to do initially?
A. Anne, Ms. Anne Andrews, said that we have -- we have a -- a problem with an operating room device and would like to see if I can help explaining it.
Q. In your -- that first invoice, Exhibit 9A, you sent -- you say that you spent three hours studying the Bair Hugger system --
A. Correct.
Q. -- and conducting discussions with Anne Andrews and colleagues.
What in -- if -- what did you do initially to study the Bair Hugger system?
A. So reading information on the web from 3M about the device.
Q. Anything other than what 3M posted on the web?
A. There could be other papers that I looked at from NIH or other -- I mean, I don't recall, but

Page 44

it would be papers that I Googled.
Q. Okay. Did you physically see a Bair Hugger unit during this period of time?
A. During this period of time, no.
Q. Okay. Have you -- have you seen a Bair Hugger?
A. Oh, definitely, yeah.
Q. When was the first time you saw one?
A. I -- I -- can I ask them about the meeting? It was in -- at UCI.
MS. ANDREWS: Unfortunately, you cannot ask me --
THE WITNESS: Okay.
MS. ANDREWS: -- to help you with any answer.
THE WITNESS: Okay.
MS. ANDREWS: Or you can't ask questions of me.
THE WITNESS: Okay.
MS. ANDREWS: Only counsel can ask you questions.
THE WITNESS: Oh, sure. So it would be a meeting --
[Reporter requests attorney and witness speak one at a time.]

Page 45

MS. ANDREWS: Hang on a second, Dr. Elghobashi. Just answer counsel's question --
THE WITNESS: Okay.
MS. ANDREWS: -- to the best of your recollection.
THE WITNESS: Okay.
MS. ANDREWS: And if you don't understand or you need him to clarify it, he will certainly rephrase it for you.
THE WITNESS: Okay.
MS. ANDREWS: The idea is to get a --
THE WITNESS: Thank you.
MS. ANDREWS: -- good record --
THE WITNESS: Correct.
MS. ANDREWS: -- and that everyone understands the questions.
THE WITNESS: So we had a meeting in -- at UCI where the counsel brought a Bair Hugger and a blanket and, yes, that will be. But I don't recall the date of the meeting.
BY MR. GORDON:
Q. Maybe this will help. Let me show you your invoice 9B which covers the period July 23rd to September 19th, 2016; is that correct?
A. Okay. So this is -- okay, the -- the July

was referring to this meeting that you asked. Okay. Reading, meeting. So in August -- on August 28th, we met at UCI, and at that time, that was the first time I see the Bair Hugger and the blanket and we made a test at that time.

[Reporter requests clarification.]

THE WITNESS: A test.

BY MR. GORDON:

Q. What test did you do at that time?

A. So we put Gabriel on the table like this, a conference room, and we cover him with the Bair Hugger blanket and we activated the -- the blower, the BH blower.

Q. Okay. I'm going to anticipate this because I think this is -- is that Exhibit 8, is that the number you wrote?

MS. ANDREWS: That's correct.

THE WITNESS: That's something else. Then this is -- we --

MS. ANDREWS: There's no question pending, Doctor.

THE WITNESS: Okay. That is --

MR. GORDON: I'm just --

THE WITNESS: That's something else.

BY MR. GORDON:

Q. I'm -- I'm showing Exhibit 8, a series of four photographs that were --

A. Correct, yes.

Q. -- produced to us this morning.

A. Uh-huh.

Q. What -- what are these photographs of?

A. These were in operating room in Santa Monica, California. I don't know the date, but it could be September 2016. And we put a volunteer patient on an operating --

MS. ANDREWS: He doesn't have a question pending.

THE WITNESS: Okay.

MS. ANDREWS: You have to wait for him --

THE WITNESS: Okay.

MS. ANDREWS: -- to direct you --

THE WITNESS: Okay. Okay.

MS. ANDREWS: -- to what he wants to know about the photos.

THE WITNESS: Okay.

BY MR. GORDON:

Q. Why don't you tell me what those photos depict.

A. So in an operating room, we asked a registered nurse to set up the operating table and a

blanket and the drapes as she usually does, and we asked the volunteer patient to lie down and we run the BH blower.

Q. When you say "we," who else was present?

A. Ms. Anne Andrews and John and another counsel, Leila -- I don't know her last name.

Q. Anyone other -- besides lawyers and the -- this RN?

A. The RN, they were -- there was a company. We wanted to see if they can do a CAD for this room.

MR. GORDON: So we're up to Exhibit 12.

(Whereupon Exhibit 12 was marked for identification.)

BY MR. GORDON:

Q. I'm going to show you what -- what I've marked as Exhibit 12. Does that appear to be a copy of your expert report in this matter? Is that -- is this your expert report, Exhibit 12?

A. Correct.

Q. Okay.

A. It looks like.

Q. Okay. And if you turn to page 10 of Exhibit 12, there appears to be a -- a computer --

A. Yes.

Q. -- assisted drawing --

A. Yes.

Q. -- at the bottom. Is -- was this done by the company that you were -- you're talking about, in the lower left-hand corner, Figure 4(a)?

A. No, that -- that is not done by that company, no.

Q. Did that company do any --

A. No, they -- they couldn't.

Q. Okay.

A. They couldn't.

MS. ANDREWS: Wait. You need to wait for him to --

THE WITNESS: Oh, okay.

MS. ANDREWS: -- finish his question.

THE WITNESS: Okay. Okay.

MR. GORDON: Well --

MS. ANDREWS: Objection. Calls for attorney work product.

You can answer.

BY MR. GORDON:

Q. Well, what was your understanding of why they couldn't do it? Was it a computer problem or --

A. They were using -- yeah, but --

MS. ANDREWS: If you know.

Page 50

THE WITNESS: No. No, they were not. Yeah.
BY MR. GORDON:
Q. Okay. Just -- just to save counsel some time and effort, every question I ask you, I only want what you know. So if you don't know something, then you can say, "I don't know."
A. Okay.
Q. But if you do know, then you can answer.
A. Sure.
Q. This way, your counsel won't have to --
A. Okay. Okay.
Q. -- you know, say "if you know" --
A. Okay.
Q. -- anymore. Okay?
The picture on the Exhibit 12, page 10, I guess Figure 4(b), where did that picture come from?
A. I don't recall. It could being Gabriel, the counsel Gabriel.
MS. ANDREWS: If you don't recall, you don't recall.
THE WITNESS: I don't -- okay. I don't recall.
MS. ANDREWS: See, Counsel also doesn't want me to tell you this, but I really am going

Page 51

to --
THE WITNESS: Uh-huh.
MS. ANDREWS: -- this one time, tell you. Guessing is not evidence.
THE WITNESS: Okay.
MS. ANDREWS: So if you're speculating --
THE WITNESS: Okay.
MS. ANDREWS: -- when you're not sure, it's --
THE WITNESS: Right.
MS. ANDREWS: -- not admissible to the Court.
THE WITNESS: Uh-huh.
MS. ANDREWS: So he doesn't want you to guess or speculate.
THE WITNESS: Okay.
MS. ANDREWS: And nobody wants you to.
THE WITNESS: Sure.
MS. ANDREWS: Thank you.
THE WITNESS: Thank you.
BY MR. GORDON:
Q. Yeah. And -- and again, so she doesn't have to keep doing that, if a question I ask you calls for you to guess, tell me that, that you can't answer without guessing. Otherwise, you know,

Page 52

you -- you can answer. And --
A. Uh-huh. Okay.
Q. -- if you have some basis for -- for thinking an answer might be something -- for example, this picture, did you take the picture?
A. No.
Q. Did you, yourself, go out to, you know, a source like Getty Images or go online --
A. No.
Q. -- and find the picture?
So someone else provided you with this picture; is that right?
A. Someone else, yes.
Q. Okay. And it wasn't a grad student or --
A. No.
Q. It wasn't somebody, you know, working under your direction who provided this picture to you?
A. Correct.
Q. It was one of the attorneys who provided it to you; is that right?
MS. ANDREWS: Objection. Calls for speculation. Attorney work product.
THE WITNESS: I don't recall.
BY MR. GORDON:

Page 53

Q. You don't. Okay.
Who besides the attorneys that you've worked with has provided you with any information that you've incorporated into your report?
A. No one -- I may have found it on the web. I'm -- I'm just trying to remember as much as I can, right?
Q. Okay. My question, though, goes to --
A. Yeah.
Q. -- who -- who assisted you in -- in compiling information to go into your report?
MS. ANDREWS: Objection. Work product. Calls for attorney work product communication regarding expert reports.
THE WITNESS: I don't recall. I may have obtained them by myself from the web.
BY MR. GORDON:
Q. I'm -- I'm speaking more broadly.
A. Oh, okay.
Q. Maybe -- your report -- I mean, I assume you had some assistance in -- in, you know, preparing it, typing it, things like that.
A. Uh-huh. Okay.
Q. You didn't do it all by yourself, right?
A. Yeah.

MS. ANDREWS: Yeah, the -- Counsel, let's just be clear. The new rules do not permit any -- and I believe that these are the rules that have been in play in this case with your witnesses and will be with your witnesses, that we are not -- and are not required to go into background conversations, drafts, communications with counsel are all off limits and I will be instructing him not to answer unless I hear a question that's properly posed to the witness.

BY MR. GORDON:

Q. I -- I'm not asking you if your -- if the attorneys you're -- you're working for typed up your -- your report. I'm assuming you didn't sit yourself at a -- at a keyboard and type up the report.

MS. ANDREWS: Objection. Argumentive. Calls for speculation.

Can you -- do you want that question back?

THE WITNESS: I would -- I would like to, yes.

MS. ANDREWS: Don't answer any question that you have not understood. And if I object or counsel has comments about the question, be sure and have it read back so it's clear in your mind before

you answer it.

THE WITNESS: I typed this report.

BY MR. GORDON:

Q. Okay. Did you have any graduate students assist you in any aspect of this report?

A. Yes.

Q. Who?

A. That would be Dr. Apte, A-P-T-E. He's a professor.

Q. Is he at Stanford?

A. He used to be at Stanford. He's now at Oregon State.

Q. Oregon State. Okay.

And what did Dr. Apte -- what were -- what was Dr. Apte's contribution to the -- to your report?

A. Running the computer program.

Q. The -- the code for the model?

A. Correct, yes.

Q. Okay. And, in fact, the -- the code that was used is proprietary code of Dr. Apte's, correct?

A. Correct.

MS. ANDREWS: Yeah.

BY MR. GORDON:

Q. So Dr. Apte actually ran the -- the

model --

A. Correct.

Q. -- correct?

Based on boundary conditions that you provided to him, right?

A. Correct.

Q. Okay. Did Dr. Apte participate in actually dev- -- developing the -- the boundary conditions?

A. No. I did.

Q. Okay. Was he physically present, you know, in Santa Monica when you went into that operating room?

A. No.

Q. Was he physically present for any aspect of this, or was this just something where he, up in Oregon, ran the -- ran the code?

A. So we met few times.

Q. Where?

A. At APS meet- -- American Physical Society meeting in Portland.

Q. Okay. When -- do you know when that was?

A. This was in November, before Thanksgiving.

Q. Now, did he charge for his work?

A. Correct.

Q. Did he bill the plaintiffs separately for that?

A. No. He -- only with me.

Q. Okay. And did -- did you then bill the plaintiffs' counsel for Dr. Apte's work?

A. Correct.

Q. Okay. Let's -- we -- we're jumping around a little bit because I'm just trying to put things together.

A. Yeah.

Q. 9C is the -- is the third invoice that was provided this morning. What -- and that -- I -- what -- what's the period of time that that covers?

A. February 17 to March 17.

Q. 2017, right?

A. Correct.

Q. Okay. So in those three invoices, 9A, 9B and 9C, I don't see any reference to a payment for Dr. Apte or any -- any other outside consultant. Did I -- did I miss it or would -- would there have been some other invoice?

A. Right. I -- I paid Dr. Apte. I paid him after I get the funds from the counsel.

Q. Okay. But in order to get the funds from

the counsel, did you submit any kind of a written statement?
A. Correct, I did.
Q. But -- and it's not one of those?
A. It's not. It's not one of those, no.
Q. Okay.
MS. ANDREWS: Counsel, I do apologize. I have a document to hand you. I don't mean to interrupt, but this is response to Item No. 9. It was just handed to me and I forgot to put it in the files, but that is a document responsive to Request No. 9 that's germane to your line of questioning.
MR. THORNTON: That's 9E at this point.
(Whereupon Exhibit 9E was marked for identification.)
MR. GORDON: E as in Edward?
MS. ANDREWS: Correct.
BY MR. GORDON:
Q. So to, I guess, this new document, the 9E, that --
A. Correct.
Q. Does that --
A. Yeah, that's --
Q. -- fill in the gap?
A. Correct.

Q. Okay. So you -- you -- basically, you billed on a project basis?
A. Correct.
Q. And, in fact, 9D is a series of four checks that --
A. Correct, they were -- yes.
MS. ANDREWS: Let him finish the question.
THE WITNESS: Oh, I'm sorry.
MS. ANDREWS: It takes a little bit --
THE WITNESS: Okay.
MS. ANDREWS: -- of time to get in the rhythm --
THE WITNESS: Okay.
MS. ANDREWS: -- and he just needs to get his question finished because oftentimes --
THE WITNESS: Okay.
MS. ANDREWS: -- they change meaning at the end in the fray.
THE WITNESS: Okay. Okay.
MS. ANDREWS: So just be patient and he'll be patient and listen to your answer.
THE WITNESS: Sure.
BY MR. GORDON:
Q. So 9D is a series of four checks that total $130,000, and that, I -- I believe, is the

project cost in -- listed in 9E --
A. Yes.
Q. -- is that right?
A. Correct.
Q. Okay. Other than the -- the checks for 100 and -- the total $130,000 and the three checks that are attached to the invoices, 9A, B, and C, are -- were there any other --
A. No.
Q. -- payments?
A. No.
Q. Okay. Were there any other invoices or written submissions that you made re- -- to seek payment?
A. I have to go to my records, but seem -- it seems, yeah.
Q. Okay.
A. The major one is this one, yeah, on the record.
Q. And by "this one," you're -- you're -- just so the record's clear, you -- you pointed to 9E?
A. Correct.
Q. Okay. Okay. Now, in this one, 9E, you say, "The following data will be provided by

Gabriel: 1, The dimensions and locations of all items and medical staff in the room. (tables, lamp, heater, PC, surgeon, nurses, et cetera.) 2, the dimensions and locations of the inlet and exit air grilles. 3, the air inflow rates at the ceiling grilles and the outflow rates at the lower grilles. 4, the electric power output of the lamps, PC, et cetera in the room. 5, the air inflow rate to the blanket blower, and the temperature of the air leaving the blanket. 6, a drawing of the blanket and the locations of the drape edges near the floor."
Do you see where I read that?
A. Yes.
Q. Who is Gabriel?
A. The counsel sitting there.
Q. Mr. Assaad?
A. Right, yes.
Q. Okay. And did that in -- did Mr. Assaad, in fact, provide the -- those data points to you?
MS. ANDREWS: Objection. Compound.
THE WITNESS: Okay. Not all the data -- not all the items, no. Not all.
BY MR. GORDON:
Q. Okay. Tell -- please tell me which ones

he did not provide to you.
A. The dimensions of the rooms, the location and inlets of the grille, air inflow, electric outlet, air inflow rate to the blanket blower. Probably this maybe from the specification of the Bair Hugger, so No. 5. Okay. And No. 6, a drawing of the blanket, location of the drape edges. A drawing of the blanket. So Gabriel provided specification of the Bair Hugger and a drawing of the blanket, 5 and 6.
Q. So the only things on this list that --
A. Correct.
Q. -- Mr. Assaad provided --
MS. ANDREWS: Let him answer -- let him ask the question.
THE WITNESS: Okay.
MS. ANDREWS: Let's start over.
THE WITNESS: Okay.
MS. ANDREWS: Thank you, Counsel.
MR. GORDON: It's -- it's hard, I know.
BY MR. GORDON:
Q. The only things on this list of 1 through 6 on page 9 -- or on Exhibit 9E that Mr. Assaad provided to you were Nos. 5 and 6; is that correct?
A. Correct.

Q. Okay. And that in- -- it included the temperature of the air leaving the blanket?
A. The --
MS. ANDREWS: Wait. Let him hand it back to you.
THE WITNESS: Okay. The temperature of air leaving the blanket, he provided a 3M table. I think it's one of the exhibits that you took. 41C, I don't remember. 41 or something.
BY MR. GORDON:
Q. Okay. And in your report, you -- you make a reference to a YouTube video. Do you recall it?
A. For -- yeah, from 3M.
Q. Right.
A. And that's --
MS. ANDREWS: Wait, wait.
THE WITNESS: Okay.
MS. ANDREWS: There's no question pending.
THE WITNESS: Yes.
BY MR. GORDON:
Q. I -- so you -- is that something that you reviewed yourself, the 3M video?
A. Definitely, yes.
Q. And that's -- that's something that you relied on in -- in developing the boundary

conditions that you provided to Dr. Apte?
A. That video, we took only the dimensions of the room only, 7 meter by 7 meter.
MS. ANDREWS: Jen, thanks.
BY MR. GORDON:
Q. If I could direct your attention to page 32 of Exhibit 12, your expert report. And under the -- I guess this is Section 3.4, the boundary conditions --
A. Correct.
Q. -- begins on page 28.
A. Yes.
Q. In the middle of the page, you -- you say, "The temperature of the hot air at the BH blower outlet is prescribed equal to 109 Fahrenheit (42.77 Celcius) and the temperature of the air leaving the drape edge is set equal to 106 Fahrenheit --
A. Correct.
Q. -- (41.11 --
A. Correct.
Q. -- C) according to 3M video at," and then you -- there's a URL for a YouTube video; is that right? Do you see that section?
A. Yeah, I do.
Q. Okay. So did you use the temperature

information that you've -- that's set forth on 32 from the YouTube video in any way in connection with developing the boundary conditions?
MS. ANDREWS: Objection. Vague and ambiguous.
THE WITNESS: 41 degrees Centigrade, the air exits from the blanket.
BY MR. GORDON:
Q. I -- I may have misunderstood you, and if I --
A. Okay.
Q. -- I did, I apologize. But I -- I thought you had said that the only thing you used from the 3M YouTube video in developing the boundary conditions --
A. Yes.
Q. -- were the room dimensions. So my -- my question is, did you also use information about the temperature from that 3M video --
MS. ANDREWS: Objection. Asked and answered.
BY MR. GORDON:
Q. -- in developing your boundary conditions?
MS. ANDREWS: Objection. Misleading.
THE WITNESS: Could you repeat the

question again, please?
BY MR. GORDON:
Q. Well, I -- I'm trying to understand where you got the information that you used for your boundary conditions with respect to temperature. And I want to make sure I'm -- I -- I under- -- understand where you got that.
A. Okay.
Q. I thought I heard you say earlier that the only thing you got from the YouTube video were the dimensions of the room. Reading this, it seemed that you also got the temperature conditions.
MS. ANDREWS: Objection. Mischaracterizes prior testimony.
BY MR. GORDON:
Q. So I'm just -- I just want to be clear. I want to -- if you turn to page 33, under Table 2, under temperature of hot air leaving the drape edge --
A. Uh-huh, yes.
Q. -- you have 41.11 degrees --
A. Correct.
Q. -- Celcius, and that appears to be the same number that you list on page 32 as having been "according to 3M video."

A. Yes.
Q. Okay. So where did you get the 42 -- the -- where did you get the -- the temperature of 41.11 degrees Celcius for the temperature of hot air leaving the drape edge as you list on Table 2?
A. Okay. From the 3M video, yes.
Q. Okay. So that -- and that would -- that's one of the boundary conditions that you provided to Dr. Apte, correct?
A. Yeah, we usual -- okay, yes.
Q. Okay. Did you do anything to verify that 41.11 degrees Celcius temperature as being a -- a correct boundary condition for the temperature of hot air leaving the drape edge?
A. Yes. There is a 3M table, which is one of the exhibits, that showed the model and the blanket and -- and it shows sometimes even higher than 41, like, 41.6.
Q. When you say one of the exhibits, it's something in your report or --
A. No. It's -- was given you today.
Q. Oh, okay.
If you see it, call out, because I --
THE WITNESS: This one.
MS. ANDREWS: You can thank me now,

Counsel. It's this exhibit that we gave to you earlier to -- for the record.
THE WITNESS: Yeah.
MS. ANDREWS: Our 3M tables.
BY MR. GORDON:
Q. Okay. So you're -- what you're referring to just a moment ago as the verification of the --
A. Correct.
Q. -- 41.11 is Exhibit --
A. Uh-huh.
Q. -- is that 1D?
MS. ANDREWS: It was previously marked when we gave it to you as --
THE WITNESS: 1D.
MS. ANDREWS: -- 1D.
THE WITNESS: Like David.
BY MR. GORDON:
Q. Okay.
A. And -- yes. So here, the new model, 750, and then the blanket, 522, and you can see -- yeah, it's even -- it even reaches 42.4. It's higher, yeah.
BY MR. GORDON:
Q. Is it -- before you hand me -- hand that back to me, can you -- can you show me, is there

anywhere on Exhibit 1D that indicates that the -- any of the temperatures listed there are a reflective of the temperature of air that would be exiting the edge of a drape over the patient and the Bair Hugger blanket?
A. None.
Q. Okay. And on the YouTube video, is it your recollection that the temperatures -- the temperature that was given of 106 degrees Fahrenheit, that the -- that -- is it your recollection that the video indicated that that was the temperature of the air leaving the drape edge?
A. I don't recall the video, of what it said on the video. I do not recall.
Q. Okay. Did you do any measurements with a -- you know, take -- take temperatures, you know, with a thermocouple or a -- some -- some sort of a --
A. It --
Q. -- instrument?
MS. ANDREWS: Let him finish. Let him finish.
THE WITNESS: No.
BY MR. GORDON:
Q. Okay. Going back to those four

photographs -- what was that exhibit?
MS. ANDREWS: Eight.
THE WITNESS: Eight.
BY MR. GORDON:
Q. Exhibit 8. Those were taken at UC Irvine?
A. Nine -- no.
Q. Oh, I'm sorry. Where were those photos taken?
A. Santa Monica.
Q. Oh, I'm sorry. Okay. So those photographs --
A. From Santa Monica.
Q. I see. Okay. How -- how was it that you gained access to an operating room at -- in Santa Monica? Is that something you arranged?
A. No.
Q. Do you know who arranged it?
A. The counsel.
Q. Okay. And do -- what -- was it -- what type of operating room was it that you were given access to?
A. Orthopedic surgery operating room.
Q. Okay. And what time of day was it?
A. We arrived at 9:00 o'clock and we stayed until late.

Q. In the evening?
A. Afternoon, maybe. I don't recall.
Q. Were -- were there any surgeries being performed while you were there?
A. No.
Q. Was there any hospital staff present other than the RN?
A. No.
Q. And I think you said you -- you went to Santa Monica, the OR, in was it September of 2016?
MS. ANDREWS: Objection. Asked and answered.
THE WITNESS: I -- it could be, but I am not sure.
BY MR. GORDON:
Q. Well, in -- in terms of when you developed the boundary conditions that you provided to Dr. Apte --
A. Uh-huh.
Q. -- would your visit to Santa Monica have been before or after you developed those boundary conditions?
A. Before.
Q. Okay. And when you were in the OR in Santa Monica, did you turn on the -- the Bair

Hugger?
A. Correct.
Q. Did you take any temperature measurements?
A. No.
Q. Did you take any velocity measurements?
A. No.
Q. Did you take any -- well, the -- the Exhibit 4 appears to be a --
A. The dr- --
MS. ANDREWS: Wait.
BY MR. GORDON:
Q. Let me -- let me finish the question.
A. Okay.
Q. It look -- it looks like there's a -- a -- some sort of a ruler or --
A. Right.
Q. -- tape measure depicted in the -- those photographs; is that right?
A. Correct.
Q. Who is -- can you tell who's holding that? It looks like -- I'm -- I'm assuming you don't wear nail polish.
A. Right. So I -- the -- could have been one or --
MS. ANDREWS: If you know.

THE WITNESS: Okay.
MS. ANDREWS: You don't have guess or speculate.
THE WITNESS: Yeah, I just forgot.
MS. ANDREWS: If you don't know, you tell him you don't know.
THE WITNESS: Yeah, I don't recall, yeah.
BY MR. GORDON:
Q. Would -- the -- the hand that appears there, is that the RN, do you know?
MS. ANDREWS: Objection. Asked and answered.
THE WITNESS: I don't recall.
BY MR. GORDON:
Q. Okay. Were you there when the tape measure -- measurements were used?
A. Oh, yes.
Q. Okay.
A. Yes.
Q. What -- what was the purpose of -- of doing the tape measurements?
A. The -- the only thing I can re- --
MS. ANDREWS: Would you --
THE WITNESS: Oh.
MS. ANDREWS: Doctor, I'm really going to

have to keep reminding --
THE WITNESS: Okay. Okay.
MS. ANDREWS: -- you and counsel's going to be just as annoyed with me as I am with you. Please do not start your question until after his -- your answer 'til after his question is --
THE WITNESS: Okay.
MS. ANDREWS: -- absolutely completed.
THE WITNESS: Okay.
MS. ANDREWS: He -- he's asking them slowly and you're jumping the gun. So just be patient and let him get his entire question out to be fair. Thank you.
MR. THORNTON: Keep in mind, this woman down here has to take all the questions and answers --
THE WITNESS: I'm sorry, yes.
MR. THORNTON: -- and if you're speaking over each other --
THE WITNESS: I apologize.
MR. THORNTON: -- it can't be done.
MR. GORDON: By the time we're done with this, you'll be a pro. Probably not.
BY MR. GORDON:
Q. Okay. Why -- just -- why were the

measurements taken with the tape measure as reflected in Exhibit 4?
A. To get the geometry of the drape.
Q. Were any other measurements or dimensions taken that day?
A. All the drape measurements.
Q. So was the main purpose of -- of your visit to the operating room in Santa Monica that day to obtain detailed measurements of the -- of the drapes, or the drape; is that right?
A. Not only, yeah.
Q. Okay. And that's what -- that's -- that's fine. That -- that's where I want to go next.
A. Okay.
Q. What other -- what other things did you -- did you do while you were in that OR?
A. To find out where the air leaving, the hot air of the BH leaving the drape.
Q. How did you do that?
A. Observing where the air is going from using -- asking the patient sitting there -- the -- and touching the air that leaves the drape where all the positions of the drape, yes.
[Reporter requests clarification.]
THE WITNESS: All the position, yes.

BY MR. GORDON:
Q. So you -- would -- when you say touch, you used your hand?
A. Uh-huh, correct.
Q. Okay. You didn't use any instrumentation?
A. Correct.
Q. Okay. Now, the patient, do you recall how the -- the patient was laying on the table? Was -- was -- it looks like a -- is it -- was it a him? It's hard to tell from that.
A. Yeah.
Q. Were -- were his hands extended?
A. Yes.
Q. And the Bair Hugger was across the --
A. Correct.
Q. -- upper torso -- let me finish -- up -- upper torso and arms; is that right?
A. Correct.
Q. And it was face -- the -- the holes of the blanket were facing downward; is that right?
A. Correct.
Q. Was the blanket -- the Bair Hugger blanket conformed around the patient's arms in any way?
MS. ANDREWS: Objection. Vague and ambiguous.

THE WITNESS: There were ties and the end of the blanket were tied properly on the arms.
BY MR. GORDON:
Q. Was the -- and was the blanket -- the blanket is -- is essentially flat, correct?
A. Correct.
Q. So when it was laying on the arms of the mock patient there, were the -- were the sides that extended beyond the arms folded or curved around the arms?
A. Yes.
MS. ANDREWS: Objection. Vague and ambiguous.
BY MR. GORDON:
Q. And they were then cinched down with a -- the tie; is that right?
A. Correct.
Q. And there was a single blanket placed over it, the -- the Bair Hugger blanket? Or single -- excuse me. Strike that.
There was a single drape placed over the Bair Hugger blanket?
MS. ANDREWS: Objection. Vague and ambiguous.
If you don't understand the question,

don't answer it.
THE WITNESS: The drape was covering as shown here in the picture.
BY MR. GORDON:
Q. The blue?
A. The blue, yeah.
Q. Okay. And was there anything other than that single blue drape that was covering the Bair Hugger blanket?
MS. ANDREWS: Asked and answered.
THE WITNESS: I don't recall.
BY MR. GORDON:
Q. What was the blue drape made of?
A. Plastic.
Q. What was its thickness?
A. I don't recall.
Q. And you were -- when you were doing this -- or participating in this exercise, it was your understanding that the -- that that's -- this was how it's normally done in operating rooms; is --
MS. ANDREWS: Objection.
MR. GORDON: Let me finish.
MS. ANDREWS: Thank you.
BY MR. GORDON:
Q. A single plastic drape is placed over the

Bair Hugger blanket and nothing else; is that --
MS. ANDREWS: Objection. Argumentative. Calls for speculation.
BY MR. GORDON:
Q. Was that your understanding?
A. We asked the RN to set up the patient exactly as in operation.
Q. Okay. And so your understanding was that in a regular operation, a single plastic drape is placed over the Bair Hugger?
MS. ANDREWS: Objection. Mischaracterizes prior testimony. Calls for speculation. It's been asked and answered.
THE WITNESS: I cannot answer the question.
BY MR. GORDON:
Q. You -- you don't have an -- an understanding as to what your understanding was as to whether that was representative of a typical operation or not?
MS. ANDREWS: Objection. Argumentative. Misleading.
THE WITNESS: I was told the setup was a normal operation -- operating room setup.
BY MR. GORDON:

Q. Okay. Did you do anything independently to -- to see if the information that you were provided about what is a normal setup in an operating room was, in fact, accurate?
A. No.
Q. Okay. Did you know the RN who did the setup?
A. No, never seen her before.
Q. You had nothing to do with --
A. Okay.
Q. -- arranging it?
A. Okay.
Q. So that was all done by counsel, right?
A. I do not know the nurse. I did not know her, if she had before.
Q. You could have measured the actual temperature of the air that was exiting from the blanket edge in Santa Monica, couldn't you?
MS. ANDREWS: Objection. Calls for speculation.
THE WITNESS: Measurements have to be done accurately.
MS. ANDREWS: Objection. Move to strike, nonresponsive.
Did you laugh, Counsel?

MR. GORDON: Yeah.
MS. ANDREWS: You know, I --
MR. GORDON: No, I --
MS. ANDREWS: -- I take -- I want you to know --
MR. GORDON: I'm -- I'm laughing at your moving to strike the answer of your --
MS. ANDREWS: I want you to know, Counsel, I take serious offense at people who laugh during federally noticed and subpoenaed depositions of witnesses.
MR. GORDON: Yeah.
MS. ANDREWS: They're not funny and I would ask you to not do that again.
MR. GORDON: Well, Counsel, I take offense at lawyers who com- -- continuously violate the rules that prohibit speaking objections and coaching and trying to control --
MS. ANDREWS: But you haven't heard me laugh at you, have you, sir?
MR. GORDON: No.
MS. ANDREWS: You haven't heard me laugh at your questions, have you, sir?
MR. GORDON: No. I --
MS. ANDREWS: I will not. So I'm asking

you to -- to give me --
MR. GORDON: Your --
MS. ANDREWS: -- the same courtesy.
MR. GORDON: Your -- your motion to strike your --
MS. ANDREWS: And my witness the same courtesy.
MR. GORDON: Yeah, your motion to strike your witness's answer to --
MS. ANDREWS: Let's take a break.
MR. GORDON: -- my question --
MS. ANDREWS: We're taking a break.
MR. GORDON: -- is not proper.
MR. THORNTON: It's been 45 minutes.
MR. GORDON: Yeah, that's fine.
MS. ANDREWS: Going off the record.
THE VIDEOGRAPHER: Off the video record at 12:44.
(Recess.)
THE VIDEOGRAPHER: We are back on the video record. This is DVD No. 2. The time is 1:31.
BY MR. GORDON:
Q. Dr. Elghobashi, I'm going to hand you back Exhibits 9A, 9B and 9C, the invoices that were previously marked. I -- I looked through there and

didn't see any reference to go -- to the visit to Santa Monica. Is there anything in there that describes that or reflects that? Maybe it was described differently?
A. It should be here. I don't know where it is. It should be.
Q. As you recall, did you bill for your time in going to Santa Monica?
A. Correct.
Q. Aga- -- to maybe help contextualize the time, take a look at 9E. That's your proposal --
A. Okay.
Q. -- that's dated, I think, was that September 14th --
A. Correct.
Q. -- 2016?
Was that proposal prepared before or after your visit to San- -- to the OR in Santa Monica?
A. That could be before.
Q. And it looks like I don't have the exhibit number, but will the exhibit that would cover that time frame of September --
A. Yeah.
Q. -- 2016, it looks like the last entry on that is September, I think, 16th?

A. 19.
Q. So September 19th?
A. Right.
Q. And then the next bill that picks up --
A. Is May.
Q. -- isn't until May, it looks --
A. May -- May and March.
Q. March of --
A. Yeah.
Q. -- 2017?
A. Yeah.
Q. Is it possible that there was an invoice in between September 2016 and May -- March of 2017 that isn't reflected here?
MS. ANDREWS: Calls for speculation. Asked and answered.
You can answer.
THE WITNESS: All right.
BY MR. GORDON:
Q. Well, could I ask you to check your -- your files and see if you have any additional invoices beyond the -- the three that are reflected there, and if so, provide them to your -- to counsel to provide to us?
A. Agree.

Q. Thank you.
When you went to -- so when you went to Santa Monica, you already had drafted Exhibit 9E, the proposal?
A. Correct.
Q. Okay. Now, in 9E, you say, "The distribution of the blower air along the periphery will be needed as an input together with a temperature of the blower air." It's, like, the third paragraph down.
A. No. 5?
Q. No. It was in the -- unfortunately, I have only have one copies, but it's --
MS. ANDREWS: I have more.
BY MR. GORDON:
Q. Under operating room description, the second full paragraph, the last sentence.
A. Oh, okay. "Distribution of the blower air along the periphery will be needed..." Yes.
Q. Okay. What did you mean by that?
MS. ANDREWS: Can I just interrupt? I'm sorry. Now that I have my copy, where are you reading, Counsel?
THE WITNESS: It's here, "the distribution".

MS. ANDREWS: Thank you.
Okay. Do you have the question in mind?
THE WITNESS: Oh, could you please repeat the question?
MS. ANDREWS: I apologize.
BY MR. GORDON:
Q. What did you mean by that statement?
A. That means we need this information, as you read, for the boundary conditions on the drape.
Q. Okay. And by that information, we're talking about distribution. Let's start -- let's take it in small pieces. The distribution of the air. Again, I don't have it in front of me, so I'm kind of doing -- winging it a little bit here.
A. Sure. Okay.
Q. "The distribution of the air along the periphery." That --
A. Okay.
Q. That was one. And the other part of that sentence was "together with the temperature of the blower air."
MS. ANDREWS: Counsel, I'm going to hand you a copy since I made numerous.
MR. GORDON: Oh, great. Thank you. Much easier.

MS. ANDREWS: So you can break it down --
THE WITNESS: Thank you.
MS. ANDREWS: -- in response to the subpoena that you thanked me for earlier. We can now ask the questions.
BY MR. GORDON:
Q. So what do you mean -- what -- what does the phrase "distribution of the blower air along the periphery," what does that mean?
A. How many kilograms per second leaving the drape edge.
Q. Kilograms?
A. Yeah.
Q. I'm sorry.
A. Kilograms per second. Mass flow rate.
MS. ANDREWS: Wait a second.
[Reporter requests clarification.]
MR. GORDON: Mass flow rate?
THE WITNESS: Correct.
MS. ANDREWS: Now, can I just -- I'm sorry, Counsel.
When you're going to use technical jargon --
THE WITNESS: Okay.
MS. ANDREWS: -- you have to be sure that

you speak loudly and clearly because --
THE WITNESS: Okay.
MS. ANDREWS: -- our reporter --
THE WITNESS: Sorry.
MS. ANDREWS: -- Madam Reporter needs it, and we all need to understand exactly --
THE WITNESS: Okay.
MS. ANDREWS: -- the measurements of technical jargon you're using, or we're all going to jump on you, Doctor, so --
THE WITNESS: Uh-huh.
MS. ANDREWS: -- thank you.
BY MR. GORDON:
Q. Okay. So when you referred to the distribution of the blower air along the periphery, that's what you're looking -- what you're talking about there is the mass flow rate of the air at the periphery of the drape?
A. Correct.
Q. Okay. And the temperature of the blower air, temperature is temperature, right?
A. Correct.
Q. And but you -- where are you saying you will need the temperature of the blower air? The blower -- I mean, there's several parts along the

way where there's blower air. At what point did you need the temperature?
MS. ANDREWS: Objection. Compound. Objection. Vague and ambiguous.
You can answer.
THE WITNESS: Temperature at the drape edge.
BY MR. GORDON:
Q. Okay. So what you were looking for is two things at the drape edge, mass flow and temperature, right?
A. Correct.
Q. Okay. Now, when you went to Santa Monica, that was after you had 9E, right?
A. Correct.
Q. Okay. And you -- you said you stuck your hand along the drape edge; is that right?
A. Correct.
Q. You could have used an instrument that would be capable of measuring mass flow --
MS. ANDREWS: Objection.
BY MR. GORDON:
Q. -- couldn't you?
MS. ANDREWS: Objection. Calls for speculation. Argumentative.

Page 90

You can answer.
And also mis- -- mischaracterizes prior testimony.
THE WITNESS: I asked the patient under the blanket and there was no air leaving anywhere except on the floor.
MR. GORDON: Okay.
MS. ANDREWS: Move to strike; nonresponsive.
BY MR. GORDON:
Q. And we -- we'll actually come back to that, but I -- what I want to -- are you -- are you aware of any instrument that is cap -- that -- that is used in engineering to measure mass flow?
A. Yes.
Q. A hot wire and a anemometer, is that something that you're familiar with?
A. Yes.
Q. You ever used one?
A. Yes.
Q. Would a hat- -- would a -- would -- well, strike that.
Anything else that -- that -- that you have used to -- as an instrument that can actually measure mass flow rates?

Page 91

A. You need to measure velocity in 3D.
Q. How do you do that?
A. Laser Doppler anemometer or PIV.
MS. ANDREWS: Could you repeat that, Doctor? I want to be sure we got it.
THE WITNESS: Laser Doppler anemometer or PIV.
MS. ANDREWS: Thank you.
BY MR. GORDON:
Q. Is that particle --
A. Image velocimetry.
MS. ANDREWS: Don't -- don't -- he's not -- wait for his question to be finished and then you start yours.
BY MR. GORDON:
Q. Particle image velocimetry.
And that's a -- that's a -- a piece of equipment, or is it a -- it would be a particle image velocimeter; is that right?
A. (Inaudible response.)
Q. So is there any reason why you could not have used -- let's start with a hot wire anemometer, in that OR in Santa Monica --
MS. ANDREWS: Calls for speculation and argumentive. Mischaracterizes prior testimony --

Page 92

BY MR. GORDON:
Q. -- to measure the mass flow?
MS. ANDREWS: Same objection.
THE WITNESS: Could you repeat the question again, please.
BY MR. GORDON:
Q. Is there any reason why, when you went to the OR in Santa Monica, you couldn't have used a hot wire anemometer to measure the mass flow at the drape edge?
MS. ANDREWS: Same objection.
THE WITNESS: You need a lot of preparation and equipment.
BY MR. GORDON:
Q. What equipment would you need besides the hot wire anemometer, if any?
MS. ANDREWS: Calls for speculation.
THE WITNESS: You would need computers and other instruments to connect --
MS. ANDREWS: And other what?
THE WITNESS: Instruments.
MS. ANDREWS: Instruments, sorry. Thank you.
THE WITNESS: Yes.
BY MR. GORDON:

Page 93

Q. Have you ever seen a hand-held hot wire anemometer?
A. I have.
Q. Have you ever used one?
A. No.
Q. So other than needing a lot of preparation and equipment, there's -- there -- there would be no reason why you couldn't have measured the --
MR. GORDON: You know, Counsel's shaking her head. I -- I -- I guess she's trying to convey something to you. Maybe we should have the videographer put the video on Counsel.
MS. ANDREWS: You know, that would be a good idea if you have a video on both of us, Counsel, because of your objections and your outbursts, including laughing at me. What I'm trying to do is help you allow the witness to finish because he's having trouble finishing -- allowing you to finish your question. So let's -- let's ask another question --
MR. GORDON: Counsel, you'll --
MS. ANDREWS: -- before you interrupt.
MR. GORDON: You'll -- you'll forgive my skepticism that your motives --
MS. ANDREWS: I'm not interested --

MR. GORDON: -- are -- are -- are pure.
MS. ANDREWS: -- in your opinions. I am telling you that we are trying to get a clear record. I have ordered -- I have -- I have a gentleman here that's going to give very technical information. I have ordered realtime so that I can understand the answers just like you and we're struggling with the technical difficulties of this deposition and nothing more.
Now, ask your question, sir.
MR. GORDON: I would ask you, Counsel, not to give any more nonverbal cues to your witness like that very obvious shaking of your head.
BY MR. GORDON:
Q. Is there any reason -- and bear in mind, this is the question that your counsel clearly wants to you answer no to.
MS. ANDREWS: Objection. Move to strike.
I'm sorry. That is totally inappropriate. And you will not do that again, sir, or it's going to take --
MR. GORDON: Well, I --
MS. ANDREWS: Or we're going -- there are going to be consequences for --
MR. GORDON: You know what? Let's make a

deal.
MS. ANDREWS: -- that type of garbage.
MR. GORDON: Let's make a deal, Counsel.
MS. ANDREWS: No, there's no deal.
MR. GORDON: I won't do that again if you don't ever --
MS. ANDREWS: There's no deal.
MR. GORDON: -- instruct your witness how to answer a question by --
MS. ANDREWS: Sir --
MR. GORDON: -- shaking your head.
MS. ANDREWS: And you left the deposition earlier. Highly inappropriate with the video, and that has been documented for the Court as well.
This -- this witness is not waiting until your questions are finished and it's not fair to you and it's not fair to him. I have ordered realtime in order to try to help make a clear record. And if you want to ascribe some -- some other motive to it, keep it to yourself and keep it professional.
MR. GORDON: I've been in --
MS. ANDREWS: Ask your question, sir.
MR. GORDON: I've been in lots of depositions, Counsel --
MS. ANDREWS: Ask your question, sir.

MR. GORDON: -- where wit- -- I -- where --
MS. ANDREWS: I'm going to give you one more chance to ask your question.
MR. GORDON: You're going to give me a chance?
MS. ANDREWS: That's right.
MR. GORDON: Thanks, Counsel.
MS. ANDREWS: You're welcome.
MR. GORDON: I've been in lots of depositions where witnesses have not made --
MS. ANDREWS: I'm not interested in where you have been. I am interested in this witness giving an answer to a clear question --
MR. GORDON: There's an easy --
MS. ANDREWS: -- in fair and honest way that he can understand.
MR. GORDON: There's an easy way to signal to a witness that he needs to pause.
MS. ANDREWS: I am not going to listen to this.
MR. GORDON: You hold your hand up.
MS. ANDREWS: I am --
MR. GORDON: Your visible shaking of your head when I'm asking a question --

MS. ANDREWS: Objection.
MR. GORDON: -- is very clearly --
MS. ANDREWS: There is no --
MR. GORDON: -- prompting.
MS. ANDREWS: That is your interpretation of what I have done. There is no reason for you to put that in any context other than my trying to get a clear record. Stop it; ask your question. Or we'll take our lunch break until you decide to take a question.
MR. GORDON: If -- if you -- if you shake your head --
MS. ANDREWS: One more time.
MR. GORDON: -- one more time --
MS. ANDREWS: I'm warning you.
MR. GORDON: -- to -- to signal your client --
MS. ANDREWS: I'm warning you.
MR. GORDON: -- we are going to end this deposition --
MS. ANDREWS: I'm warning you.
MR. GORDON: -- we are going to go to the Court.
MS. ANDREWS: I'm warning you. Ask a question.

MR. GORDON: Stop warning me.
MS. ANDREWS: Ask a question.
MR. GORDON: You don't get to warn me.
MS. ANDREWS: I can get to -- I can do whatever I want to keep you in the bounds of the law to ask proper questions that can be answered.
MR. GORDON: You're -- you're going to go in front of our Court in Minnesota and say that it's pop -- perfectly proper --
MS. ANDREWS: Sir --
MR. GORDON: -- when a question's being asked to go -- be shaking your head as vigorously as you can so --
MS. ANDREWS: Ask a question.
MR. GORDON: Right.
MS. ANDREWS: You're shaking your head an awful lot too and you're yelling and that is highly inappropriate. Ask a question and we'll proceed.
MR. GORDON: That's because your conduct is beyond --
MS. ANDREWS: Would you like a lunch break?
MR. GORDON: -- the bounds.
MS. ANDREWS: Would you like a lunch break, sir, until you can --

MR. GORDON: Nope.
MS. ANDREWS: -- calm down?
BY MR. GORDON:
Q. Back to my question, sir.
MS. ANDREWS: Thank you. Appreciate it.
BY MR. GORDON:
Q. Other than the need for a lot of preparation and equipment, is there any reason why you couldn't have used a hot wire anemometer to actually measure the mass flow rate at the drapery edges when you went to the operating room in Santa Monica?
MS. ANDREWS: Objection. Calls for speculation. Mischaracterizes prior testimony.
THE WITNESS: Preparations and instruments.
BY MR. GORDON:
Q. And I'm sorry, what?
A. Instruments.
THE REPORTER: Instruments.
BY MR. GORDON:
Q. Right. Is there anything other than preparation --
MS. ANDREWS: Wait a minute.
BY MR. GORDON:

Q. -- and instruments?
MS. ANDREWS: Did somebody just ask him what he said instead of the court reporter? Can --
MR. ASSAAD: No, she didn't.
MS. ANDREWS: Yeah, but I don't --
THE REPORTER: You don't want me repeating what he said?
MS. ANDREWS: No, I don't. I don't.
THE REPORTER: Okay.
MS. ANDREWS: I want -- I want to read what you --
THE REPORTER: That's fine.
MS. ANDREWS: -- write and I want to be able to ask him what he said.
THE REPORTER: Okay.
MS. ANDREWS: But I appreciate your help, but it's just not appropriate.
THE REPORTER: Okay.
MS. ANDREWS: Thank you.
So you said preparation and instruments; is that correct?
THE WITNESS: Correct.
MS. ANDREWS: Okay. Thank you.
BY MR. GORDON:
Q. Is there anything other than preparation

and instruments that precluded you from taking actual measurements of a mass flow rate when you went to Santa Monica?
MS. ANDREWS: Same objection.
THE WITNESS: I've already answered it.
BY MR. GORDON:
Q. Don't -- well, I just want to make -- I'm sorry. I'm not trying to be argumentative. I'm -- there is noth- -- no other reason that you couldn't have taken measurements other than lack of equipment and preparation, right?
MS. ANDREWS: That was his answer, sir. Objection. Asked and answered.
BY MR. GORDON:
Q. Okay. Is that -- so -- I'm -- I'm -- I'm sorry. If --
MS. ANDREWS: If there's a question, just --
MR. GORDON: I'm not --
BY MR. GORDON:
Q. I just want to be clear. If you had had the instruments and had done the preparation, you could have actually measured the mass flow rate, right?
MS. ANDREWS: Objection. Asked and

answered.
BY MR. GORDON:
Q. Is that right?
MS. ANDREWS: Same objection.
THE WITNESS: I said preparation and instruments.
BY MR. GORDON:
Q. I -- I understand what you said. I -- I just want -- I want to be clear. If you had done the preparation, whatever preparation is necessary, and if you had brought the instruments, then you could have measured the mass flow rate, right?
MS. ANDREWS: Objection. Asked and answered. Argumentative now. Asked three times.
If you have an answer, you need to answer. If you don't have an answer, you can so -- still simply tell counsel you don't have an answer.
THE WITNESS: I do not have an answer.
BY MR. GORDON:
Q. Okay. The other thing in that sentence on 9E that you said would be needed as input was the temperature of the blower air, right?
A. Correct.
Q. And earlier, you -- you -- I -- you explained that that -- by that, you meant the

temperature of the air that was exiting the -- at the periphery of the drape --
MS. ANDREWS: Objection. Asked --
BY MR. GORDON:
Q. -- right?
MS. ANDREWS: -- and answered.
You can answer.
THE WITNESS: The temperature of the air, yes.
BY MR. GORDON:
Q. As it exits at the drape edge?
A. Correct.
Q. Okay. And that could have been measured with a thermometer, right?
A. No.
Q. What -- are there instruments that are capable of measuring temperature?
A. There are many other instruments.
Q. Okay. What -- what would be the appropriate type of instrument to use to measure the air coming out of the edge of the drape?
A. Different anemometers.
Q. Could a -- are there hot wire ane- -- anem- -- anemometers that could have measured both the air -- the mass flow rate and the temperature?

MS. ANDREWS: Calls for speculation. Compound.
THE WITNESS: I answered your question, right?
BY MR. GORDON:
Q. I -- I don't recall an answer. Are you aware of hot wire anemometers that are available that measure both mass flow rate and temperature?
MS. ANDREWS: Compound. Asked and answered.
MR. GORDON: Counsel, how is that compound?
MS. ANDREWS: You had two objects in there, Counsel.
MR. GORDON: Yeah. The question is is there something -- is he aware of something that combines the two objects. That -- that's the essence of the question.
MS. ANDREWS: Thank you.
MR. GORDON: That's not a compound question.
MS. ANDREWS: I think you happen to be correct. I apologize. Thank you for correcting me.
BY MR. GORDON:
Q. Do you want the question read back?

MS. ANDREWS: Please.
THE WITNESS: Please.
(Record read as follows:
"Q. Are you aware of hot wire anemometers that are available that measure both mass flow rate and temperature?")
THE WITNESS: The hot wire anemometers measures velocity, not mass flow rate.
BY MR. GORDON:
Q. Okay. Is there a way to calculate mass flow rate if you know the velocity and the area?
A. Yes.
Q. Okay. And the area, you actually took measurements, that -- that allowed you to actually measure the area of the drape edge, correct?
A. Correct.
Q. And you incorporated those measurements in your CFD, correct?
A. Correct.
Q. But you have no actual measurements of the velocity of the air exit -- exiting the edge of the blanket, correct?
MS. ANDREWS: Objection. Asked and answered. Argumentative. Mischaracterizes prior

testimony.
THE WITNESS: If you know the mass flow rate from the blower and you know the drape geometry, you can get the velocity leaving.
BY MR. GORDON:
Q. So you took the mass flow rate as it exits the Bair Hugger where? At the -- at the nozzle end or out the blanket?
MS. ANDREWS: Well, that's compound, Counsel. Objection.
THE WITNESS: The mass flow rate is the same.
BY MR. GORDON:
Q. Okay. And how long does it stay that way?
MS. ANDREWS: Objection. Calls for speculation.
THE WITNESS: Always.
MS. ANDREWS: Improper hypothetical. Sorry.
BY MR. GORDON:
Q. So once the air exists the Bair Hugger at whatever its mass flow rate, it maintains that mass flow rate forever. Is that your testimony?
A. The mass flow rate leaving the blower is the same mass flow rate that leave the blanket

holes, forever.
Q. Okay. Once it leaves the blanket holes, you're saying it maintains that same mass flow rate forever?
A. The mass flow rate leaving the blanket exit -- that leave the blower exit is identical to the mass flow rate that leave the blanket holes, period.
Q. Okay. I -- and I'm taking it to the next step. The mass flow rate of the air leaving the blanket holes, does that stay constant forever?
MS. ANDREWS: Objection. Asked and answered.
THE WITNESS: As long as the blower running, the mass flow rate will be the same.
BY MR. GORDON:
Q. So I -- I want to -- I want to make sure I understand, because you're -- you're -- this is your area of expertise, not mine. If we were to set up the Bair Hugger blanket at the -- that far end of the room such that the -- the jets were pointing towards the -- the other end of the room, you're saying that the mass flow rate right outside the blanket would be identical to the -- the far wall?
A. I did not say that.

Q. Okay. That's what -- that's my question, so I apologize if I've --
A. Okay.
Q. -- if I asked it in a confusing way.
A. Yeah.
Q. At what -- what -- what impacts the mass flow rate after the air has exited the blanket?
A. Okay. If the mass flow rate of the blanket is covered by the drape, it would remain as it is until it leaves the drape.
Q. If the drape was 100 feet long, it would maintain the same mass flow rate all the way to the -- to that edge; is that right?
A. As long as the drape is impermeable, no holes in it.
Q. Okay. There are no -- no loss of coherence to the jet?
MS. ANDREWS: I didn't get the word.
THE REPORTER: Impermeable.
MS. ANDREWS: Okay. Impermeable?
THE WITNESS: Correct.
MS. ANDREWS: Thank you.
THE REPORTER: Sorry.
MS. ANDREWS: That's not what you typed. It's okay. I just want to be sure we're -- we got

it. Okay.
I apologize, Counsel.
THE WITNESS: Could you repeat that question?
MR. GORDON: Sure.
BY MR. GORDON:
Q. If the drape is 100 feet long, would it -- would -- the mass flow rate would -- may -- would remain constant on all along the edge of the -- the drape?
A. If the drape is impermeable, no leaks, the mass flow rate that comes from the blower will always be under the drape until it leaves.
Q. And is the velocity of the air the same as it leaves -- as it leaves the blanket, as it leaves the --
A. Never.
Q. -- edge of the drape?
MS. ANDREWS: Hang on. I'm sorry. Wait, wait. Let him ask the question again.
Doctor, I'm sorry to keep interrupting.
THE WITNESS: Okay.
MS. ANDREWS: This is very important technical --
THE WITNESS: Okay.

MS. ANDREWS: -- testimony. He wants an answer to his question.
THE WITNESS: Okay.
MS. ANDREWS: And I want you to give a fair --
THE WITNESS: Sure.
MS. ANDREWS: Gave him a fair question, you get a --
THE WITNESS: Sure.
MS. ANDREWS: -- fair answer.
THE WITNESS: Sure.
MS. ANDREWS: Can you please repeat it, Counsel?
BY MR. GORDON:
Q. Okay. The velocity -- first of all, the velocity is one of the components that -- that allows you to calculate mass flow rate, correct?
A. We use the mass flow rate to calculate the velocity, not the other way around.
Q. Okay. The mass flow rate is the --
A. Of the blower.
MS. ANDREWS: Wait. Don't talk when he's talking. Sorry.
BY MR. GORDON:
Q. The mass flow rate is a -- is a

relationship between the amount of the air moving over a particular area over a period of -- particular period of time, right?
A. The mass flow rate that comes from the blower would remain fixed until it leaves the drape edge.
Q. Will the velocity remain fixed?
A. Never.
Q. Okay. Will the temperature remain fixed?
A. If the drape is insulated, it would remain without a change.
Q. For how long?
A. The longer, the better.
Q. So a insulated drape that was 100 feet long, if you put the Bair Hugger blanket up against the top of it at the 100 feet below, the -- the temperature would remain exactly the same; is that what you're saying?
A. No.
Q. Would it be more, less, or what would happen to it?
A. It depends on the conditions surrounding.
Q. And what -- what are the conditions that will impact it?
A. The ambient flow, ambient temperature.

Q. And how long will the -- strike that.
In your 9E, one of the two charac- -- two boundary conditions you said you would -- you would need in that one sentence we read was the temperature of the blower air, which you then explained you meant the temperature as it comes out of the -- the drape edge.
You never measured that temperature, did you?
MS. ANDREWS: Objection. Argumentative. Asked and answered.
THE WITNESS: I did not.
BY MR. GORDON:
Q. Okay. The only basis for your boundary condition that you provided to Dr. Apte for the temperature of the air emerging at the edge of the drape was what you gleaned from the YouTube video and Exhibit 1D --
MS. ANDREWS: Objection.
BY MR. GORDON:
Q. -- is that correct?
MS. ANDREWS: Sorry. Objection. Mischaracterizes former testimony. Calls for speculation. Lacks foundation.
I'm sorry. You can answer, Doctor, if you

have the question in mind.
THE WITNESS: And a lot of thinking.
BY MR. GORDON:
Q. Okay. Why didn't you measure the temperature when you went to Santa Monica?
MS. ANDREWS: Asked and answered. Objection.
THE WITNESS: I answered that earlier.
BY MR. GORDON:
Q. I apologize.
A. Instruments and --
MS. ANDREWS: Same objection.
THE WITNESS: -- and preparation.
BY MR. GORDON:
Q. And -- and I think we were talking -- I may -- I may have missed it, but we were -- spent a fair amount of time talking about the mass flow rate. Now I'm specifically talking about temperature. And if your answers are the same, that's -- that's fine, but I -- I don't think we talked about temperature.
A. Instruments and preparation.
Q. Okay. What instruments would you have needed to measure the temperature?
MS. ANDREWS: Asked and answered.

Page 114

THE WITNESS: Anemometers, computers, software.
BY MR. GORDON:
Q. And you thought it was unnecessary to obtain those instruments and do the preparation necessary to actually measure the temperature --
MS. ANDREWS: Objection. Argu- --
BY MR. GORDON:
Q. -- is that right?
MS. ANDREWS: Argumentative. Calls for speculation. Lacks foundation.
You can answer.
THE WITNESS: I never thought unnecessary.
BY MR. GORDON:
Q. I'm sorry. You never thought it was unnecessary?
A. Correct.
Q. That's a -- you mean -- so you thought it was necessary?
A. Yes.
Q. So why didn't you do it?
A. I substituted by thinking hard.
[Reporter requests clarification.]
THE WITNESS: Correct.
BY MR. GORDON:

Page 115

Q. Okay. So had you suggested that that -- that what you wanted to do was actually take measurements and were told, no, don't?
A. No.
Q. Okay. So you thought it was necessary to take measurements, but you chose to just think about it instead?
A. Correct.
MS. ANDREWS: Asked and answered. Argumentative.
BY MR. GORDON:
Q. What was it that made you decide you were going to go the thinking route rather than the measuring route?
A. Experience.
Q. And what about your experience told you that thinking was the way to go?
Well, let me ask the question a different way. Have you had any experiences in your very long and prominent career in -- in computational fluid dynamics where you found that your thinking about a boundary issue yielded a better result that actually measuring it?
MS. ANDREWS: Objection. Unfair -- improper hypothetical. Lacks foundation and calls

Page 116

for speculation.
THE WITNESS: Never better, but equivalent.
BY MR. GORDON:
Q. Okay. So what did your thought process entail that you used instead of actual measurements?
A. I cannot answer that.
Q. I'm sorry, you can -- I'm sorry?
A. I cannot answer that.
Q. Okay.
A. It's a complex system.
MS. ANDREWS: Well, wait. Wait. Move to strike. Withdraw as nonresponsive.
Just tell -- Counsel, will you -- can we just be -- that question is answerable. I think he didn't understand it, so if you'll allow him to answer what his thinking and thought process is, I won't have to take him on redirect, but -- on direct, but it's up to you. He has an answer.
BY MR. GORDON:
Q. Do you know what she wants you to say now?
A. No.
MS. ANDREWS: Objection. Move to strike.
BY MR. GORDON:
Q. I mean, I -- I just want to -- I want to

Page 117

find out what your -- what your thinking is, so please tell me.
MS. ANDREWS: That's right. So do we.
THE WITNESS: Experience means one solves different problems at all the time from which I can figure out solutions to something that you cannot measure for the cir- -- circumstances.
BY MR. GORDON:
Q. When you say you cannot measure, are you talking about inconvenience or serious impediments to -- to measurement?
A. Instruments and preparation.
Q. Throughout your career, have you ever used your thought process in lieu of instruments like anemometers to measure some important boundary condition?
A. It depends on the problem.
Q. Can you think of any?
A. You can -- I can rely on previous experiences to find out what the temperature in that situation based on other experiences.
Q. Well, what previous experiences did you rely on to -- to -- to come up with the temperature boundary condition?
A. I think they are in my resume, in my CV,

the projects. There are many projects in the back of -- yeah.
Q. Do any of them involve a patient warming device?
A. No.
Q. Have you ever done any work in connection with a patient warming device?
A. Never.
Q. You ever done any work in connection with any medical device at all?
A. Yes.
Q. What medical devices have you done work for -- work on?
A. Not a device, but medical problems, yes.
Q. Re- -- respiratory problems?
A. Right, yes.
Q. Okay. In fact, you have six peer-reviewed publications on PUBMED right now, right?
A. Do I? I don't know.
Q. Okay.
A. I never -- I never looked.
Q. You've got hundreds of other publications, though, right?
A. I really don't -- don't remember. Yeah, that I recall, yeah.

Q. But other than work that you've done related to respiratory issues, you haven't done any other work in the medical field, right?
A. Correct.
Q. And to my specific question, you have never done any work that relates to a medical device, right?
A. Correct.
Q. Did you have an opportunity to review the expert report of Thomas Kuehn, submitted by the defendants in this case?
MS. ANDREWS: I think maybe we should show it to him.
MR. GORDON: Exhibit -- I'm just -- yeah, I'm going to. Exhibit 13.
(Whereupon Exhibit 13 was marked for identification.)
MS. ANDREWS: He doesn't pronounce it that way.
MR. GORDON: Who doesn't?
MS. ANDREWS: That's not the man's name, how it's pronounced, so he might not know who you're talking about.
MR. ASSAAD: There's -- there's two Keens.
MR. GORDON: Is it pronou- -- I don't --

I'm not -- is it Kuehn?
THE WITNESS: Kuehn, yeah. It's a German name, yeah.
MR. GORDON: Okay.
THE WITNESS: So --
MS. ANDREWS: Thank you.
THE WITNESS: -- which page, please?
MR. GORDON: Well, actually, that makes life a lot easier because we have another expert named Keen who definitely pronounces it "Keen."
MS. ANDREWS: Right.
MR. GORDON: So --
MS. ANDREWS: So, Counsel, just --
MR. GORDON: -- now that I've been properly --
MS. ANDREWS: Admonished.
MR. GORDON: -- instructed on --
BY MR. GORDON:
Q. Do -- do you know Dr. Kuehn?
A. No.
Q. Okay.
MS. ANDREWS: I'm just going to object about this examination and -- and -- on the basis that we just got these reports on June 2nd. I mean, I'll be happy to allow him to answer questions

that -- that he's had a chance to review it, but this wasn't something that we've had the luxury of going over in detail.
BY MR. GORDON:
Q. Is this the -- and simple question, is the first time you've seen his report, Exhibit 13?
A. I mean, I've seen it, but I never read it, really.
[Reporter requests clarification.]
THE WITNESS: Really.
BY MR. GORDON:
Q. So are you aware, as you sit here today, that Dr. Kuehn actually did take measurements of both temperature and velocity of --
A. I'm not aware.
Q. Okay.
MS. ANDREWS: Just let him answer -- just be sure he gets his whole question out, in fair -- fairness to him.
THE WITNESS: Okay.
MS. ANDREWS: And we're just going to reassert our -- our right, based on today's ruling, to present rebuttal testimony at trial on these reports. I think that's been made clear, but I just don't want there to be any misunderstanding.

MR. GORDON: I'm going to show you Exhibit 14.
(Whereupon Exhibit 14 was marked for identification.)
MR. GORDON: This is the copy of an expert report of Dr. Gary Settles. I assume I'm pronouncing that one correctly.
MS. ANDREWS: I think so.
BY MR. GORDON:
Q. Now, have you seen Exhibit 14 before today?
A. I have seen it, yes.
Q. Did you read it?
A. No.
Q. Did you read any of it?
A. Not really. I -- I've seen the pictures only.
Q. Okay. Did you look at the videos that are associated with --
A. No.
Q. -- the report?
A. No, no.
MR. ASSAAD: I would like to indicate to counsel that we have yet to receive the videos of -- underneath Settles' report, so that's a very

misleading question.
MR. GORDON: Oh, I honestly didn't know that you hadn't. Is -- was there a technical glitch on that?
MR. ASSAAD: They didn't come. They didn't come with the --
MR. GORDON: Okay.
MS. ZIMMERMAN: It's not in the Dropbox. It's not electronically provided. We didn't get a hard copy of anything with a disk.
MR. GORDON: Oh. Well, I'll follow you on that, find out what the problem is.
Putting that aside.
THE WITNESS: Okay.
BY MR. GORDON:
Q. So have you -- and do you know Dr. Settles?
A. No.
Q. You ever heard of him?
A. No.
Q. Are you aware that Dr. Settles took certain measurements, actual measurements of temperature and airflow from the Bair Hugger?
A. I'm not aware. And I just, when I looked at this, I saw Schlieren pictures.

[Reporter requests clarification.]
THE WITNESS: Schlieren, S-C-H-L-I-E-R-E-N. That's all.
BY MR. GORDON:
Q. And just flipping through that, you --
A. Yeah, that's all, yeah.
Q. Okay. So you have no idea whether the Schlieren images that Dr. Settles took, what they show?
A. No. No. Schlieren's visualization, it's not quantitative.
Q. Not quantitative?
A. Correct.
Q. And by quantitative, you mean something that actually measures in a -- in a particular unit of measurement, right?
A. Correct.
Q. Okay. Are you aware that Dr. Settles took measurements in addition to the Schlieren photography?
A. No.
Q. I guess not?
A. No.
Q. So as you sit here today, I take it you have no idea whether Dr. Kuehn's measurements or

Dr. Settles' measurements either validate or refute the boundary condi- -- any of the boundary conditions that you used in your CFD?
A. No.
Q. And if they -- if the measurements differ from your boundary conditions by an order of magnitude, would that cause you to question the validity of your CFD?
A. Never.
MS. ANDREWS: Objection. Vague and ambiguous and improper hypothetical.
BY MR. GORDON:
Q. Okay. And that's because you --
MS. ANDREWS: The answer was?
MR. ASSAAD: Never.
MS. ANDREWS: Thank you.
THE WITNESS: Never.
BY MR. GORDON:
Q. And that's because you believe your CF- -- the CFD based on your boundary conditions based on your thinking is more accurate than measurements actually taken; is that right?
A. I repeat what I've said. My CFD is accurate if you have measurements in the same conditions I took, then it will be very accurate.

Q. As I understand it, you provided the boundary conditions to Dr. Apte?
A. Correct.
Q. And he, using his proprietary software, generated the CFD, right?
A. Correct.
Q. If those boundary conditions were not reflective of the real world, then the CFD may be accurate based on the boundary conditions that you provided, but it doesn't provide any insight into the real world, right?
A. Disagree.
Q. So even if the boundary conditions are significantly different than real world conditions, you believe the CFD is -- is an accurate depiction of the real world conditions?
A. The CFD produces accurate results for the boundary conditions installed in the code.
Q. Right. But if the boundary conditions are incorrect, the CFD is not going to be correct, right?
A. If the boundary conditions -- CFD results reflect boundary conditions. That's all. So --
Q. The boundary conditions that you --
A. Correct.

Q. -- gave Dr. Apte to put in, right?
A. Correct.
Q. And if the boundary conditions you gave Dr. Apte to put in are inaccurate, then the CFD is also inaccurate, right?
A. I do not give inaccurate boundary conditions.
Q. Okay. In Exhibit 9E, you list nine steps for which you charged $120,000, right?
A. Yes.
MS. ANDREWS: Hold on. What's going on? Hang on a second.
THE WITNESS: Yes.
MS. ANDREWS: Got it. I have it.
MR. GORDON: Keep that for a moment.
BY MR. GORDON:
Q. Is there anywhere in that list of nine steps where you include validation?
A. Validation is needed only if you have a new code you never used before, not validated.
Q. So once a code has been validated in one circumstance --
A. Yes.
Q. -- it's valid for any set of circumstances; is that your testimony?

A. If the code was tested for far more complex situation than the operating room, far more complex, then it will be accurate for a -- for a lower level computations.
(Whereupon Exhibit 15 was marked for identification.)
BY MR. GORDON:
Q. Let me show you Exhibit 15.
I'll represent to you that that's a series of screenshots, but from a -- from a much lengthier presentation on "Sudden Expansion - Verification & Validation."
You're familiar with this, aren't you?
MS. ANDREWS: He asked you if you're familiar with it.
THE WITNESS: Oh, you're asking me?
BY MR. GORDON:
Q. Yes.
A. I thought you were talking to yourself.
So which page? Or what -- what you want me to look?
Q. Well, Exhibit 15. You're -- you wrote it, right?
A. Did I write this?
Q. You don't recognize it?

MS. ANDREWS: You can take a few minutes to look at it.
THE WITNESS: I -- I -- oh, yeah, this is -- oh, it's good. This is the course I teach for undergraduates. Yeah, correct.
BY MR. GORDON:
Q. Yeah.
A. I didn't realize.
MS. ANDREWS: I know. Go ahead.
BY MR. GORDON:
Q. On the first page there it says authors Yong Wang and Said Elghobashi?
A. Well, I didn't read that. I'm sorry. I never thought this would be on the web. How did you -- okay. Good.
Q. Oh, it's --
MS. ANDREWS: Everything's on the internet, right?
MR. GORDON: The web is a mysterious place.
THE WITNESS: Yeah, this is an undergraduate course, yeah.
BY MR. GORDON:
Q. Okay. So this is what you use to teach undergraduates?

A. Absolutely.
Q. Okay. And could you read that first sentence under the -- that you wrote on the -- under the statement "Verification and Validation"?
A. "It is very important that you take the time to check the validity of sol- -- right, yes.
Q. Of your solutions?
A. Sure, yeah.
Q. And it -- the -- the words "very important" are --
A. Yeah. That's --
Q. -- are in bold face, right?
MS. ANDREWS: Wait, wait. You're doing it again. Let's just --
THE WITNESS: Okay.
MS. ANDREWS: Question, answer.
THE WITNESS: Okay. I'll wait for you.
MS. ANDREWS: If you need time to form -- if you need time to read something --
THE WITNESS: Okay.
MS. ANDREWS: -- or answer something better, just tell counsel.
THE WITNESS: Okay.
MS. ANDREWS: But don't talk at the same time.

THE WITNESS: Okay.
BY MR. GORDON:
Q. You -- so in -- in your teaching of -- of undergraduates --
A. Sure.
Q. -- in this material you say it is very important, and you emph- -- and bold faced very important --
A. Yes.
Q. -- that you take the time to check the validity --
A. Yes.
Q. -- of your solution.
What are you -- what are you telling your students when you -- when you say that?
A. What's written here.
Q. Okay. What did you do to validate the solution in the CFD that was created by Dr. Apte with your boundary conditions?
A. In the report that I submitted in March, it has maybe 15 papers to validate that code over 15 years.
Q. So is that -- was that what you tell your students, that -- that if the code they're using has already been validated by somebody else in some

other context, they don't -- that it isn't very important that they check the validity of their solution?
MS. ANDREWS: Argumentative.
You can answer.
THE WITNESS: So I don't know if you are aware, this is ANSYS, right? ANSYS is the black box code. So this statement is written because they are using a black box.
BY MR. GORDON:
Q. What do you mean by a black box?
A. They push buttons on it. They have no idea what's behind it. Okay? I never use ANSYS for research.
Q. Do you have access to Dr. Apte's code?
A. I have many codes.
Q. Do you have access to Dr. Apte's --
A. Yes.
Q. -- code?
A. Yes. Yes.
MS. ANDREWS: Wait, wait.
THE WITNESS: Yes. So you're asking about this, right? ANSYS is not for research. ANSYS is for teaching undergraduates.
BY MR. GORDON:

Q. Okay. So it's only undergraduates who have to -- in your view, have to validate their solutions?
A. No. I didn't say that.
Q. Okay. Help me out then.
A. This is written because they are using a black box, ANSYS Fluent.
[Reporter requests clarification.]
MR. ASSAAD: Fluent.
THE WITNESS: F-L-U-E-N-T.
BY MR. GORDON:
Q. Let me show you Exhibit 16.
(Whereupon Exhibit 16 was marked for identification.)
BY MR. GORDON:
Q. This is a paper that you co-authored on the "Numerical Solution of Laminar Flow Past a Sphere with Surface Mass Transfer."
A. Right.
[Reporter requests clarification.]
BY MR. GORDON:
Q. This is a paper you co- -- you co-authored on "Numerical Solution of Laminar Flow Past a Sphere with Surface Mass Transfer," correct?
A. Yes. Yes.

Q. In the -- the abstract or the summary at the top, the very last sentence is, "These predictions compare well with published experimental observations and other numerical results."

Do you see that?

A. Correct, yes.

Q. What -- what does that mean?

A. I think it's any code you use, you have to validate.

Q. So the code that you used in this hadn't been validated before?

A. This is an undergraduate student who never did -- so he wrote his own code under my supervision. And I'm telling him here, like I told the others, to validate, which we do all the time.

I didn't know you have access to this. This is amazing. Okay.

Q. So this code that's reflected in Exhibit 16 was validated by the experimental evidence?

A. Correct. As -- as written in the paper, yes.

Q. So now, for any future application forevermore, it's your view that this code would not need to be validated?

A. This is the laminar flow. I would say for a laminar flow, it will be fine for that student to do it, yes.

Q. Without any further validation?

A. We always validate codes always. This is undergraduate student wrote his code under my supervision, so I told him to do that. If my own code, which have been developing for 30 years, then I know exactly -- it's already validated for canonical flows and other things, then I know what is like. When you test an airplane, you test it for many years, then you give it to the pilot to take passengers. Codes are like that.

Q. Well, in fact, if you've got an airplane design that's been successful for many years and you change some small aspect of the design, there's always some validation that that design change is not going to impact its --

A. I'm aware.

Q. -- functionality, correct?

[Reporter requests clarification.]

MR. GORDON: Functionality.

THE WITNESS: I'm aware of.

BY MR. GORDON:

Q. So the fact that an airplane flies under

one set of conditions and under one particular design doesn't mean that modifying that design or modifying the conditions don't need to be checked out, right?

A. Correct. If a code was validated for all the ingredients, then it's valid. If you change the condition that the code will run for, you have to revalidate it again.

Q. Okay. And --

MS. ANDREWS: Counsel, excuse me. The charger. Sorry. Apologize. It's in their lobby, her charger.

MS. ZIMMERMAN: Should we take a break?

MS. ANDREWS: No, she's okay. I just want -- I just needed to tell somebody to go get it. I apologize.

MR. GORDON: Do you want to take your lunch break now? It's 2:30.

MS. ANDREWS: No, I think we're doing fine.

MR. GORDON: Okay.

MS. ANDREWS: We appreciate it.

BY MR. GORDON:

Q. Let me show you Exhibit 17.

(Whereupon Exhibit 17 was marked for

identification.)

MS. ANDREWS: Thank you. That's 16, the laminar flow.

MR. ASSAAD: We're at 17.

MS. ANDREWS: We're at 17 now.

MS. ZIMMERMAN: So.

MR. ASSAAD: Last one. My mistake.

MS. ANDREWS: That's okay. Looking in my stack of papers. Sorry.

BY MR. GORDON:

Q. This is the Saarinen paper that you cite in your expert report, isn't it?

MR. ASSAAD: Sorin? Oh.

MS. ANDREWS: Saarinen.

Okay.

BY MR. GORDON:

Q. Is it -- is this the paper that you --

A. Uh-huh.

Q. -- cite in your --

A. Correct.

Q. And let's -- let's talk about what you rely on this paper for, or cite it for. Turn to page 6 of your report, expert report, Exhibit 12.

A. What page?

MS. ANDREWS: Six.

THE WITNESS: Yes.
BY MR. GORDON:
Q. Okay. And the paragraph towards the bottom, I guess starting at line 123, "LES -- meaning large eddy simulation -- applied to operating rooms with medical staff and other instruments is still challenging, owing to the size of the room and the complexity of the geometries involved. At the time of the writing of this report, only one LES study has been performed for an operating room by Saarinen et al. (2015)."
Did I read that correctly?
A. Yes. Yes.
[Reporter requests clarification.]
THE WITNESS: Correct.
BY MR. GORDON:
Q. And that's Exhibit 16, right, or 17?
A. Yes.
MS. ANDREWS: 17.
MR. GORDON: 17.
THE WITNESS: Okay.
BY MR. GORDON:
Q. And you discuss the -- what the study does, and conclude that the Saarinen study, "Showed that LES can accurately predict such flows through

validation with experimental observations."
A. Correct.
Q. Why did you mention anything about the Saarinen paper?
A. It's here. It's written.
Q. No, I understand, but, I mean, you -- what -- what difference does it make that -- what the Sarimen -- Saarinen study did or didn't show?
A. I described here what Saarinen did. What -- what -- what do you want?
Q. Right, but you say it -- it showed that LES can accurately predict such flows through validation with experimental observations.
A. Okay.
Q. Your testimony is that LES is validated, and so you -- you don't -- it doesn't need any validation in --
A. Sir --
Q. -- other contexts, right?
A. Sir, let me explain to you. Code takes 15 to 20 years to develop. It's your code. You know everything about it. I cannot take a code from here (indicating) to say the -- what's quality. We just are referring that there are only one paper in the market for LES. That's all. I'm not saying --

I'm...
MS. ANDREWS: Did you finish your...
THE WITNESS: I'm just -- I do not understand your question. What do you -- what do you want to read this and say -- I -- I don't understand. Repeat it again.
BY MR. GORDON:
Q. Well, first of all, the -- the code that Dr. Apte uses, is that your code?
A. It is not my code, but I have access to it.
Q. Well, is that one you've helped develop?
A. No.
Q. So when you talk about code that you've developed over --
A. Right.
Q. -- many, many years, that -- that's --
A. A code.
Q. -- that -- that wasn't the one that was used?
A. I have other codes, yes.
Q. Okay. Why did you use Dr. Apte's code?
A. My codes are dealing something called DNS, direct numerical simulation.
[Reporter requests clarification.]

THE WITNESS: Numerical simulation.
BY MR. GORDON:
Q. So you've never developed a large eddy simulation code; is that correct?
A. DNS code is far more than LES code. It's different.
Q. Have you ever developed a large eddy simulation code?
A. DNS code is like an LES code. It's just you do some modification. It's the same thing.
Q. Why didn't you use DNS for the Bair Hugger situation?
A. I did not have enough students to run this, period.
Q. How many students were involved in running the Bair Hugger one?
A. Four or five.
Q. All in Oregon?
A. Correct.
Q. Getting back to Saarinen, what is it about Saarinen that you said that -- that it showed that LES could accurately predict such flows through validation with experimental observations?
A. As you read this paper, it -- it can confirm what I wrote here. It's a summary of that

paper.
Q. Okay. Well, let's take a look at Exhibit 17, the Saarinen paper. First of all, you -- in -- in your description of it, you say it -- it was applied to operating rooms, right?
A. Yeah, it is. They said that, I think.
Q. Okay. Could you show me where they say it, that their study involved an operating room?
A. It say that hospital isolation room, single hinged doorway. It's in the title.
Q. Is -- is it your understanding that an isolation room is the same thing as an operating room?
A. As far as geometry. I don't know the use of it, but geometry, yes. Like how many meters, how many meters, that's all.
Q. Well, that would be true of a conference room that was the same --
A. No.
Q. -- size, right?
A. A conference room is not a hospital room.
MS. ANDREWS: Wait, wait.
BY MR. GORDON:
Q. Well, tell me what's -- that's what I'm trying to understand. What's different about the

room that -- the isolation room that Saarinen used and some other room of the exact same dimensions?
A. An operating room will have ventilation in, ventilation out and an operating table. That's all I know about an operating room.
Q. Is it -- do you know if operating rooms are under positive, negative or --
A. I don't know.
Q. -- neutral pressure?
A. Yes, I do.
Q. And what are they?
A. Your -- positive or negative allows you to -- diff- -- differential pressure to allow air to leave or air to enter, for example.
Q. But -- but are operating rooms -- is it your understanding that operating rooms --
MS. ANDREWS: I don't think he was finished.
MR. GORDON: Oh, I'm sorry.
MS. ANDREWS: I apologize, but did you mean "for example" as the end of your answer?
THE WITNESS: No, I'm fine.
MS. ANDREWS: Thank you. I apologize.
BY MR. GORDON:
Q. Are operating rooms, to your

understanding, under positive, negative or neutral pressure?
A. If you want a clean room, you want all the air to leave the room. That means you have higher pressure than outside.
Q. Is that your understanding of the way operating rooms are configured?
A. No, I don't.
Q. You don't know one way or the other?
A. Correct.
Q. Okay. Do you know one way or the other whether the room that was -- the isolation room that was the subject of the Saarinen study was under positive, negative or neutral pressure?
A. I do not.
Q. Okay. There was no ventilation used in the Saarinen study, correct?
A. Perhaps.
Q. You want to take a look at it, see if there's any indication --
A. I will take me --
Q. -- that there was ventilation?
A. It will take me time to read it carefully before I make an answer.
Q. I'm not sure I want you to do that, then.

A. You want me to read this now?
Q. Well, whatever you need to read to find out what the conditions were in the Saarinen that relate to whether it was under -- whether there was any ventilation. And also, the -- the thermal conditions.
A. It will take me long time to read it carefully to answer your question.
Q. Okay. If you'll look at page 3, the first full paragraph there, maybe that'll speed it up, but by all means, take whatever time you need.
A. The first paragraph?
Q. Yeah.
A. It says isothermal scenario. Isothermal scenario.
Q. And it goes on to say without ventilation, doesn't it?
A. Right.
Q. Okay. What does isothermal scenario mean?
A. Temperature is uniform.
Q. Okay. Is the temperature uniform in an operating room?
A. No.
Q. Is there ventil- -- is -- is there ventilation in an operating room?

A. Yes.
Q. In the -- scale. Hang on one sec.
Oh, yeah. In -- in the abstract -- I read over it three times. In the middle of paragraph, it's -- they say, "It is shown that the LES method is able to reproduce at room scale the complex transient air flows generated during door opening and closing motions and the passage of a human figure through the doorway between the two -- between two rooms."
Did I read that correctly?
A. Yeah.
Q. What -- what is your understanding of what they meant by "at room scale"?
A. Using the dimensions of the room.
MS. ANDREWS: We're trying to find where you're reading, Counsel. I apologize.
MR. GORDON: Right in the middle of the abstract.
MS. ANDREWS: Right in the middle. I apologize.
MR. ASSAAD: Okay.
MS. ANDREWS: There. Thank you.
It is shown...
MR. GORDON: Okay?

BY MR. GORDON:
Q. Now, in -- in Saarinen, they -- they actually did a -- a air flow visualization experiment in addition to the CFD model, right?
A. Yes.
Q. Well, the -- the CFD that they were using was already validated, right?
A. I have no idea.
Q. Okay.
A. I don't know whose code.
[Reporter requests clarification.]
THE WITNESS: I don't know whose code. It could be ANSYS and I don't trust it. Could be.
BY MR. GORDON:
Q. Okay.
A. I have no idea.
Q. And in this particular case, the calculated migrated air volume differed by 20 percent from the actual experiment, right?
A. Did they measure velocity?
Q. Well, you're -- you're the one who cited this paper, so I'm trying to understand what -- what this paper --
A. Okay. It was just --
Q. -- the significance this paper is to

your --
A. It was just telling the readers of my report --
[Reporter requests clarification.]
THE WITNESS: Were just telling the people reading my report there is only one study mentioning LES. That's it. If I want to use this for research, I would do more work to find it junk or not junk. I don't trust anything.
BY MR. GORDON:
Q. So if you were doing the Bair Hugger thing for research --
A. Yes.
Q. -- you would have wanted to do more in terms -- in terms of measurements, validation --
A. No.
Q. -- right?
A. No. The code has been tested for 15 years for more complex flows, then it will do the Bair Hugger immediately. It's a lower level. Bair Hugger is a lower level than what the code was tested for. Trust me.
Q. So what -- what -- if you -- when you said about Saarinen, if you were doing this for research, you would do more. I'm trying to understand --

A. Okay.
Q. -- what you're saying.
A. If you want me to refer this and you want me to ask about the quality or some smoke experiments, then I have to dig harder and probably contact those authors to ask about what code they used, but I didn't. This is only for introduction.
Q. So in your experience, once a code has been validated, from that point on, it's 100 percent accurate in predicting everything as long as you put in boundary conditions that replicate some aspect of reality?
MS. ANDREWS: Objection. Asked and answered.
THE WITNESS: If it is my code or code that I used, then I will do that. Then I know where it was tested. If you have 15 years, I see all the paper that tested that code, then I go ahead. I trust it. Especially -- especially if the tests had all the physical ingredients that the next problem will have. Okay? If the physical ingredients are not the same, then I have to do new validation. That what we do all our life. You don't trust a code because it's your code or anything. If it's a new physics, then you test it again. But if the

physics in the code has all the ingredients and more and more and more, then this is a -- Bair Hugger is a trivial case.
BY MR. GORDON:
Q. Did you see Professor Abraham's expert report?
(Whereupon Exhibit 18 was marked for identification.)
BY MR. GORDON:
Q. Show you Exhibit 18. It's a expert re- -- expert -- expert report of John Abraham.
MR. ASSAAD: Not trying to interrupt, Mr. Gordon, but if we're going DOE lunch, I don't know --
MS. ANDREWS: It's 3:00.
MR. ASSAAD: It's -- if you want to get into this now, that's fine, but it's going to be --
MS. ANDREWS: It's a long --
MR. ASSAAD: I fear it's going to be a while if he's going to talk about his report.
MR. GORDON: Well, I'm guessing it's going to be about as quick as Settles' and Kuehn were, so let me just --
MR. ASSAAD: Okay.
MR. GORDON: If I'm wrong, then it would

-- then actually --
MS. ANDREWS: Can we just break by 3:00? Because some of us are getting a little woozy. Go ahead.
MR. GORDON: Yeah.
MR. ASSAAD: It's up to you. I mean, I just --
MS. ANDREWS: Yeah, you -- just find a good time --
MR. ASSAAD: I thought it was a good breaking point, but...
MS. ANDREWS: Find a good time at 3:00.
BY MR. GORDON:
Q. Is this Exhibit 18 something you've seen before?
A. I have seen before, yes.
Q. Did you read it?
A. Not all of it.
Q. But you read some of it?
A. Some of it.
Q. And that -- is it correct that you, in Exhibit 1C, this correction of typographical errors, what -- the errors that you're correcting there are ones that were pointed out in Dr. Abraham's --
A. Correct.

Q. -- paper; is that correct?
A. Correct. Correct.
Q. Okay. And one of the errors that you said -- you indicated was the heat of the lamp that you used.
A. Correct.
Q. The surgical lamp temperature?
A. Yes.
[Reporter requests clarification.]
MR. GORDON: Surgical lamp temperature.
BY MR. GORDON:
Q. And that appears in your original report on page 30 -- the table 2 that you're referring to appears on page 33 of your report. Okay?
A. Okay. Yeah.
Q. Okay. And --
MR. ASSAAD: What page are we on?
MR. GORDON: 33 --
MR. ASSAAD: Okay.
MR. GORDON: -- of Exhibit 12.
BY MR. GORDON:
Q. Now, what -- what you're saying in this correction is that what -- what you really meant to say, instead of 93.92 Celcius, was 93.92 Fahrenheit?
A. Of course, yeah.

MS. ANDREWS: Let him finish.
BY MR. GORDON:
Q. That -- that's the mistake you made, right?
A. It's a typo.
Q. Okay. Now, for the flow rate, you used meters per second, right?
A. Correct.
Q. And for the temperature of the inlet grille, you used Celcius, right?
A. Correct.
Q. On Table 2, page 33.
A. Oh, okay. I did not open this. Yes.
Q. Okay. And let me just cut to the chase.
A. Yeah.
Q. Every single one of these entries on Table 2 is in --
A. Yeah.
Q. -- is in a metric unit, right?
A. Correct.
Q. Except you're saying now that you really intended to have the number be put in for the value of the surgical lamps be in -- in an Imperial unit, Fahrenheit, right?
A. Right, yes.

Q. Why?
A. It was taken from a table of -- from a paper, and I have to tell you which paper. It has a table of all operating room equipment temperature, and was just put --
Q. Is that Memarzadeh?
A. No. No. It's -- I don't recall.
Q. O'Neill (phonetic)?
A. It could be.
Q. I'm sorry.
A. Yeah, it's -- it got -- so only -- yeah, it's -- you know, 94 Centigrade would be boiling water. Nobody has a lamp like that, right?
Q. Did this table -- did you use this table for any of the other values in there?
A. What do you mean?
Q. Well, I'm -- you said the 93.92 came out of this table --
A. Correct.
Q. -- but it was in Fahrenheit. Were any of the other numbers that you put in Table 2 from this same table?
A. No, no, no, no, no. This -- yeah, all this from this -- the air flow rate for the room, the -- it's all Centigrade. It's all metric units,

right. And, yeah, only the temperature of the surgical lamp was -- yeah, this is the last one, yeah, should -- yeah.
Q. Well, I guess we can take a break now. Maybe if you can think of what paper that table --
A. Sure, sure, sure.
Q. -- came from over lunch, that would be great.
MS. ANDREWS: Thank you.
MR. GORDON: This concludes DVD No. 2. We're now going off the video record. The time is 2:54.
(Lunch taken.)
THE VIDEOGRAPHER: We are back on the video record. This is DVD No. 3. The time is 3:55.
BY MR. GORDON:
Q. Just to follow up where we last were, did you figure out what reference it was that you used for the temperatures?
A. I think it's McNeill, but I have to check again.
Q. And again, I think you cite two different McNeill papers --
A. Okay.
Q. -- on --

A. They're, I think, the same author but different works, and I -- I don't have it with me, but it's in my -- it's -- it has a table of all temperatures of operating room gadgets, something like that.
Q. Okay. I -- let's -- I'm just a little bit perplexed.
A. Sure.
Q. Because if you look at page -- start with page 32.
A. I thought I had my -- I left it there, I think.
[Reporter requests clarification.]
MS. ANDREWS: Hang on a second. Just -- we're look -- we're getting a copy of the document.
MR. GORDON: Oh, you need his report?
MR. ASSAAD: Exhibit what? 32 of Exhibit?
MR. GORDON: 12, his report.
MR. ASSAAD: Is it up there?
MS. ANDREWS: Here.
THE WITNESS: Okay.
MR. GORDON: No.
THE WITNESS: 33.
MR. GORDON: Start with 32.
THE WITNESS: 32.

BY MR. GORDON:
Q. Well, it goes on to 33, but in the bottom of that paragraph, just above 3.5, you say, "The values are summarized in Table 3.4.2," and it cites McNeill 2012?
A. Correct.
Q. Now -- but here -- here's one of my questions. I'm -- is Table 3.4.2, is that what is identified as Table 2 on page 33?
A. Okay, let me -- let me -- (witness mumbles to self.)
342, yeah, it looks -- yeah, correct. Let me just see, yeah. So to say Table 2, so that's another typo. It should have been 3.4.2, yeah, latex. Yeah, it is this.
Q. Okay. And so what -- if we look at Table 2 on page 33 --
A. Yes.
Q. -- then the figures for the temperatures of the surgeons and the patients' heads --
A. Uh-huh.
Q. -- and the surgical lamps are all from that McNeill?
A. Correct.
Q. But the surgeons -- first of all, the --

the surgeons and the patient, that's given in Celcius, right?
A. Right.
Q. But McNeill gave the surgical lamps in Fahrenheit?
A. I have to look. I mean, I did this --
Q. Okay.
A. -- a long time ago, yeah.
Q. Okay. And where did the -- the temperature of the patient's knee come from?
A. Yeah, I have to -- I have to -- I don't recall, but I have to look. I have to let you know later.
Q. Okay.
A. Yeah.
Q. Now, on pages 65 through 70 of your report, it lists references.
A. Yes. Yes.
Q. Does this comprise the entire list of -- of the external sources that you reviewed and relied upon in preparing your report?
A. Yes.
Q. Okay. How did you go about finding these references?
A. I can go one by one to tell you.

Q. Well, let's see if we can break it down into --
A. Yeah.
Q. -- two different categories. One -- one category is some of the highly technical stuff about CFD.
A. Right.
Q. Like all the Apte ones, I'm assuming --
A. Right.
Q. -- either you --
A. I kept reading, yeah.
Q. You probably just have those by your bedside almost?
A. I'm reading. I'm reading the material and they refer to, like, for example, a paper by Memarzadeh and NIH, I go and it references and it keep continuing that. I have to look for all of them.
Q. I'm -- I'm more interested in how you found the papers that were more specific to --
A. To --
Q. -- either the Bair Hugger --
A. Okay.
Q. -- or to, you know, operating rooms --
A. Okay.

Q. -- or infection rates or things like that?
A. Okay. Operating room, starting with 3M video.
Q. Okay.
A. And then the table from 3M that shows the air temperature leaving the blower for different models, which you have today. Okay. So that will be for -- then for the ventilation rooms, we looked at many papers with the door referred in Memarzadeh --
[Reporter requests clarification.]
THE WITNESS: Many papers that were cited in Memarzadeh's paper about ventilation temperatures and things like that, yeah.
BY MR. GORDON:
Q. Are they -- and -- and those are -- would be listed here separately, or there would be references in the --
A. I'm sure Memarzadeh, his two papers and, yeah, everything is here, yeah.
Q. Is that how he pronounces it, by the way?
A. I'm not sure.
Q. Oh, okay.
A. I don't know the person. I have never met him. I just looked at -- let's see here. It's

Memarzadeh, I think. It could be Memarzadeh. I have no idea. I don't know him.
Q. Okay. I just --
A. Yeah.
Q. I don't know how to pronounce it either.
A. Yeah, it's a long one.
Q. Well, for example, the first reference you have is -- is Albrecht's --
A. Yes.
Q. -- et cetera. How did you find that?
A. Searching. Just searching. Pure searching.
Q. Well, what were you -- what were you -- where were you searching? Were you using PubMed, med-line, Google Scholar? How were you searching?
A. Oh, always Google first, and it will lead me to journals, then I go through that.
Q. And what -- and what -- do you remember what your search terms were --
A. No, I don't --
Q. -- that led you to Albrecht?
A. I don't recall.
THE REPORTER: Can you please wait until he finishes.
THE WITNESS: I don't recall.

Page 162

Oh, okay. Sorry.
I don't recall, yeah.
BY MR. GORDON:
Q. Okay. Were -- which, if any, of these references were provided to you by counsel?
A. I don't think any except -- let's see. Let me go here. Maybe the paper by Noble, it came from counsel, maybe. Noble. There are many -- Noble is a well-known guy, but I think one of them came -- yeah, one of them came from counsel, yeah, but the rest is all -- yeah, correct.
Q. Okay. Okay. And in your CFD, you sel- -- you chose to assume 3 million skin squames.
A. Correct.
Q. And do you remember the distance from the ground for the floor?
A. One centimeter.
MS. ANDREWS: Pause, please. We have a technical glitch.
I don't see that our realtime is working. I'm wondering if one of these other ones are. It just says lunch.
Can you help us with our realtime?
THE REPORTER: If we go off.
MR. GORDON: Yeah.

Page 163

MS. ANDREWS: Thank you.
THE VIDEOGRAPHER: Off the video; 4:03.
(Off the record.)
THE VIDEOGRAPHER: Back on the video record; 6:0- -- or 4:04.
BY MR. GORDON:
Q. Talking about the parameters you used for the -- the squames in your CFD, how did you decide on 3 million as the number of skin squames?
A. So human adult, the skin of a human adult is covered with 4 billion squames. The area of the human body is 2 meters square, and if you use squames measurements, photograph shows about rectangular of a square 25 micron by 25 micron. If you --
[Reporter requests clarification.]
THE WITNESS: 25 micron by 25 micron. If you divide 4 billion -- if I divide 2 meters squared by that area of one squame, you get 4 billion. I did that, but I found other papers by Snyder showing the same number.
BY MR. GORDON:
Q. You're talking about --
A. S-N-Y-D-E-R.
[Reporter requests clarification.]

Page 164

THE WITNESS: S-N-Y-D-E-R, Snyder.
BY MR. GORDON:
Q. That's a paper about retail food operations?
A. Correct.
Q. Okay. And what was it you got from this --
A. He men- --
Q. -- Snyder paper?
A. He mentioned the number 4 billion squames and has he detailed -- the title looks funny, but it's a scientific paper.
Q. Okay. Well, the -- I'm trying -- trying to understand.
A. So I'm --
Q. Okay. Go ahead.
A. Okay. So 2 meters square by a little thing, 25-micron by 25-micron, you get 4 billion. And the paper by Noble said the human being sheds 4 billion squames in one to four days. So I took one, which is the very conserve -- I took four days, means 1 billion a day. That's a very conservative estimate.
[Reporter requests clarification.]
THE WITNESS: Estimate.

Page 165

And if you have four medical staff in a room, they will be emitting 4 billion a day each -- I mean, 1 billion a day each. If you divide that by 24 hours, you get about 40 million squames per person per hour. Multiplied by four, you get 160 million squames per hour. And I took 3 million, which is less than 2 percent. I get the very lowest thing and I put them far away from the patient on the floor.
BY MR. GORDON:
Q. Well, how did you come up with the 2 percent?
A. It's a small number to divide it over the area around the table.
Q. Did you consider the impact of protective clothing that the -- the staff wears?
A. Correct. I read about that, yes.
Q. And did that factor into your calculations?
A. Correct. I mean, it's -- you read a lot about this and I came up with 3 million as a very conservative estimate to be on the floor after one hour of working in the room.
Q. Did you -- and did you factor in the impact of the ventilation system on the squames?

A. Okay. Here we go. So first I put the squames all on the floor because in a real room, they are not on the floor. It would have been very easy to put them outside -- above the -- but then I made it so conservative -- I gave 3M the best scenario, from number 2 percent of human beings and all on the floor. I could have put them in the -- spread in the room, then we follow how they spread.

[Reporter requests clarification.]

THE WITNESS: How they spread, S-P-R-E-A-D.

BY MR. GORDON:

Q. Did you read any studies or any literature that suggested that 3 million squames in the area you defined, one centimeter above the floor, is representative of what actually happens in an actual operating room during a surgery?

A. I didn't read a paper that have 3 million. I made an estimate of conserv- -- I could have put 10 million or 20 million, which is still a small percentage of the people. I just took the lowest one.

Q. But you -- your number, whatever it is, assumed, based on your calculations, that the squames that people were -- were shedding were

settling to the floor and staying there?

A. Again, I put them on the floor first and let the fluid mechanics of the room disperse them. I could -- if I had put them spread already, then I will be biasing the result that could be go to the knee directly, if they are above the lamp or something. So I made it so that their position would not be a cause of the result. So I made it so that it would not be causing artificial results. I put them far away from everybody on the floor.

Q. Do you have, other than your own calculations, any support for the idea that 3 million squames on the floor in the area you've prescribed is realistic --

MS. ANDREWS: Objection.

BY MR. GORDON:

Q. -- based on actual surgeries?

MS. ANDREWS: Objection. Argumentative. Form.

[Reporter requests clarification.]

MS. ANDREWS: Form.

THE WITNESS: When papers say a human being sheds 4 billion squames in one day to four days, I took one day. I did not take one day. I took 2 percent of that one day. To me, that is very

real realistic, to me.

[Reporter requests clarification.]

THE WITNESS: Realistic.

BY MR. GORDON:

Q. Okay. Did you factor in how -- how many squames the Bair Hugger unit would be removing through its own filtration system?

A. Very good question. If I had done this and allowed the filter in the Bair Hugger to allow squames, whatever number, whatever percentage, it will be injected over the body of the patient, and I did not do that. So I prevented all the squames from being sucked by the blower. I could have done that, but I didn't.

Q. And the squame size you used was 10 microns, right?

A. Correct.

Q. Do you have any idea what the Bair Hugger's filtration efficiency is for 10 -- particle the size of 10 microns?

A. I think it was -- I read about the filtration.

MS. ANDREWS: I just don't want you to speculate --

THE WITNESS: Okay.

MS. ANDREWS: -- or guess.

THE WITNESS: Okay.

BY MR. GORDON:

Q. Yeah, we -- we started off this morning by saying that, remember?

A. Okay.

Q. Don't speculate, don't guess.

A. Okay. Okay. Okay.

Q. Your counsel shouldn't have to --

A. Okay.

Q. -- you know, tell you that anymore.

A. Uh-huh.

MS. ANDREWS: But she will if she needs to.

BY MR. GORDON:

Q. Yeah. But -- but what she's doing is telling you don't answer this question, not --

MS. ANDREWS: You know, Counsel, that colloquy --

MR. GORDON: Well, Counsel, that was the most obvious prompt.

MS. ANDREWS: -- is just absolutely improper.

Do you have an -- do you have an answer to the counsel's --

THE WITNESS: No.
MS. ANDREWS: -- appropriate question?
Thank you.
BY MR. GORDON:
Q. So you -- as you sit here today, you have no idea whatsoever what the Bair Hugger's filtration efficiency would be for particles 10 microns in size?
MS. ANDREWS: Objection. Mischaracterizes testimony.
THE WITNESS: I can answer it clearly. It doesn't --
[Reporter requests clarification.]
THE WITNESS: I can answer you clearly. To avoid saying whether the percentage of the filter allows or does not allow, I prevented all from passing. No squames passed through the filter. That's -- that's better than anything.
BY MR. GORDON:
Q. So the Bair Hugger -- you had the Bair Hugger capturing 100 percent of the squames?
A. Not capturing. We were not allowed to go -- once it reaches the suction on the floors, on the bottom of the Bair Hugger, we put them velocity to zero, the -- the squames will not go anywhere,

stop. Okay?
Q. So what percentage of those 3 million squames were -- in your model did you calculate would reach the Bair Hugger?
A. I -- total number of squames hitting a surface in the operating room, 5 percent total. Includes hitting a table, hitting the Bair Hugger itself, but 5 percent.
Q. And you also, in your -- in your modeling, made those squames hitting other surfaces perfectly elastic, correct?
A. Correct. And this is -- this including the 5 percent.
Q. And just so the jury understands --
A. Yeah.
Q. -- when we're talking about perfect elasticity, they didn't stick to anything. They -- whatever they hit, they bounce off at exactly the same energy that they -- that they struck it with?
MS. ANDREWS: Objection. Improper hypothetical. Compound. Form.
THE WITNESS: Five percent of the 3 million reached a surface and they were -- those reaching the -- except for the Bair Hugger itself --
[Reporter requests clarification.]

THE WITNESS: The Bair Hugger itself, they were allowed to go specularly, means same angle.
BY MS. ANDREWS:
Q. Sort of like a billiard ball, right?
A. Correct.
MS. ANDREWS: Could you spell specularly for me?
THE WITNESS: S-P-E-C-U-L-A-R-L-Y.
MS. ANDREWS: Thank you.
THE WITNESS: Yeah.
BY MR. GORDON:
Q. Okay. So in your model, all of the squames except for those that went to the -- in the vicinity of the Bair Hugger bounced off anything they -- they came in contact with?
A. Only 5 percent.
Q. Well, the 5 percent that --
A. The 5 percent.
Q. -- that came in contact with any surface, they bounced right back and kept -- kept airborne?
A. Correct.
Q. There was one other surface where you had them --
A. Uh-huh.
Q. -- land, right?

A. Right.
Q. The knee?
A. Yes.
Q. Why did you have them stay there instead --
A. It stick --
Q. -- of bounce off?
A. -- because we assume that the human was not a metal surface. Collision depends on many things. Collision of particle at the surface required a particle material, surface material, and many other things. So for the knee, say if the squame reaches the knee, it will stick there.
Q. But that was the only surface in the entire operating room --
A. Right, because the other ones --
Q. Let me -- let me finish my question.
A. Oh, sure.
Q. That was the int- -- only surface -- the surface of the knee --
A. Correct.
Q. -- was the only surface in the operating room where, in your model, you had the squames sticking?
A. Correct.

Q. So you -- did you assess all the -- the surfaces in the -- in the operating room to determine if they would have whatever coefficient of friction or whatever it is that --
A. No.
Q. -- that you're attributing to the knee?
A. No.
MS. ANDREWS: Misstates prior testimony. Objection. Form.
THE WITNESS: No.
BY MR. GORDON:
Q. Okay. How about the skin surfaces of the -- the operating staff, is there any reason why the squames wouldn't stick to them the way they do to a -- to the knee in your model?
A. The clothes and -- we -- they are not the skin of the knee. It's different. The staff are all covered.
Q. And do you have any support in any of the literature you've reviewed or cited that -- for the notion that -- that airborne squame behavior in an operating room would be perfectly elastic?
A. No.
Q. Okay. Have you ever designed a patient warming device?

A. It's not my job. I did not do that.
Q. Have you ever been consulted on design of a patient warming device?
A. No.
Q. Ever published anything on patient warming devices?
A. No.
Q. Have you done any research in terms of what standard practices are in hospitals in terms of how they use Bair Huggers?
A. That's a very general question. What do you mean by that?
Q. Well, have you done any research at all in any area of how hospitals use the Bair Hugger?
A. No.
Q. Okay. Let's turn to page 1 of -- or 2 of your paper. Your -- I mean, your -- excuse me, your -- your report, Exhibit 12. In the first or the second paragraph, the introduction, you say, "Reduction of post-operative surgical site infections has been linked to two main factors."
Did I read that correctly?
A. Third line? Which line?
Q. The first line of the -- of the second paragraph.

A. Oh, second paragraph.
MR. ASSAAD: Line 7.
THE WITNESS: Oh, second.
MR. GORDON: Yeah, I'm sorry. You've made it so much easier with the -- easier and I'm not using it.
THE WITNESS: Okay. Okay.
MR. GORDON: Line 7, thank you.
THE WITNESS: Okay. Reduction of -- yes, go ahead. Yes.
BY MR. GORDON:
Q. Okay. Are you -- do you consider yourself an expert in --
A. No.
Q. -- in surgical site --
A. No, not at all.
THE REPORTER: Please let him finish.
BY MR. GORDON:
Q. You've got to let me finish the question.
A. All right.
Q. Do you consider yourself an expert in surgical site infections?
A. Never.
Q. Okay. What research did you do that allowed you to offer the conclusion that there are

two main factors in reducing postoperative surgical site infections?
A. In writing a paper, in a technical paper, you have to have an introduction to say why you're doing this research. That's the purpose of this. Okay? It doesn't say I'm an -- I don't write here I'm an expert. I didn't say that. Where does -- where did you see that?
Q. So when you say that there are two main factors, that's not based on any research --
A. No.
Q. -- or -- or analysis?
A. Noble, Clark, all these guys.
Q. Well, for that statement, you cite to NG -- I don't know how you pronounce it -- Legg and Wood, right?
A. Correct.
Q. So, I mean, do you -- did you read anything that said antibiotics have nothing do with the reduction of surgical site infections?
MS. ANDREWS: Objection. Argumentative.
THE WITNESS: No.
BY MR. GORDON:
Q. Did you read anything that told you you can, you know, disregard aseptic technique --

A. Okay. I am not a medical expert, period.
Q. Okay.
A. So keep your question to this. Thanks.
Q. Well, I --
A. Okay.
Q. I'm trying to understand what it is your -- you have concluded in your report.
A. Okay. Have you written scientific papers?
Q. I'm not -- I actually -- I am not in a position to answer your question.
A. Okay. Okay. Good. Thank you.
So writing scientific paper, you introduce the reader, whoever it is, to why you're writing this. So it's an introduction. It's a standard thing. It doesn't say anything about my expertise in this.
Q. Well, and when you're writing an introduction, even if it's for a -- an expert report that you're submitting to a -- to a court, you want to be accurate, don't you?
A. So this is accurate. This is -- because if you read these references, they will say these sentences. That's accurate. It doesn't say I'm an expert. This would be a lie, and I'm not an expert in medical hospital things.

Q. So your -- your testimony is if we go and look at the Ng 2006, Legg 2012 --
A. Yes.
Q. -- Wood 2014, somewhere in --
A. Correct.
Q. -- one or all three of those papers, it will say the reduction of postoperative surgical site infections is -- is linked to two main factors: Ultra-clean ventilation and warming?
A. Correct. Otherwise, I would not have written it.
Q. Okay. On page 3 at the bottom, you talk about forced-air warming being something that can potentially lead to surgical --
MR. ASSAAD: Is there a line number?
MR. GORDON: Thank you. 42 -- starting on 42.
MS. ANDREWS: We're there.
BY MR. GORDON:
Q. Forced-air warming can potentially lead to surgical site contamination two ways: Direct contamination and disruption of the ultra-clean ventilation.
And for -- for -- with respect to the first one, direct contamination, you go on on line

45 to say that that "risk can potentially --
[Reporter requests clarification.]
MR. GORDON: "That risk can potentially be reduced by using HEPA filters."
MS. ANDREWS: Counsel, you didn't read the first subsection. Are you aware of that? You didn't read the whole sentence.
BY MR. GORDON:
Q. Were you saying that the HEPA filters had anything to do with the disruption of ultra-clean ventilation?
MS. ANDREWS: Objection. Form.
THE WITNESS: I was reading. What's your question? I was reading this. What did you I -- I.
BY MR. GORDON:
Q. Well, I -- I thought it was clear, but --
A. Oh, no, no.
Q. Maybe I'm wrong. Are you saying that HEPA filters could potentially reduce disruption of the ultra-clean ventilation?
A. I'm trying to look at HEPA filter. I cannot see the word. Maybe I --
MR. ASSAAD: Line 46.
THE WITNESS: 46. The former risk can be potentially --

[Reporter requests clarification.]
MS. ANDREWS: Why don't you just take a minute and read it.
THE WITNESS: Yeah, okay.
MS. ANDREWS: Because he's directing you to a part of it that you need to read so you can answer his question. Take a minute.
THE WITNESS: Okay, I read it.
BY MR. GORDON:
Q. When you're discussing HEPA-rated filters, what you're talking about as something that you say could potentially reduce the risk of direct contamination --
A. Uh-huh.
Q. -- of the air from the blowers?
A. Correct.
MS. ANDREWS: Objection. Form.
BY MR. GORDON:
Q. Okay. What was the basis for you to make that observation?
MS. ANDREWS: Objection. Form.
THE WITNESS: By reading. By reading these papers.
BY MR. GORDON:
Q. Can you tell me what papers?

A. No, I cannot.
Q. What's your understanding of what a HEPA-rated filter does?
A. So micron particles cannot pass through.
Q. What size?
A. Micron. Five micron, I think.
[Reporter requests clarification.]
THE WITNESS: Five microns.
BY MR. GORDON:
Q. Can't pass through at all, is that your understanding?
A. If it's a filter working, sure, not pass.
Q. So your understanding is that a -- a HEPA-rated filter would capture 100 percent of particles --
MS. ANDREWS: Objection.
THE WITNESS: I didn't say that. I was just saying what's written here, former risk can be potentially reduced by intake filter that's HEPA rated, yeah.
BY MR. GORDON:
Q. On page 5, lines 78 through 79, you're talking -- you -- you cite several different papers before that and you say that "all information about the turbulence and velocity fluctuations is

completely modeled," and the word modeled --
A. Uh-huh.
Q. -- is in italics.
A. Correct.
Q. What did -- what did you mean by that?
A. I have to read the previous sentence to see what I mean. This is called page 44, line 79?
Q. I have page 5, line 79.
A. No, I go -- on the previous page.
Q. Oh, I'm sorry. Okay.
A. On the bottom of the page 79.
MR. ASSAAD: 76, you mean.
THE WITNESS: 76. My eyes are getting bad, yeah. Okay. There are only -- "There are only few CFD studies in the literature that use Reynolds-averaged" --
[Reporter requests clarification.]
THE WITNESS: Reynolds, that's a name, average, A-V-E-R -- average Navier -- Navier is N-A-V-I-E-R, Stokes, S-T-O-K-E-S, RANS, yes, correct.
Question?
BY MR. GORDON:
Q. Well, you're referring to those studies, you say that "all information about the turbulence

and velocity fluctuations is completely modeled."
A. Correct.
Q. And you italicized modeled.
A. Yes.
Q. What -- what were you -- what was the meaning -- what were you trying to communicate by that? What's the significance of the fact that they were all?
A. Correct.
Q. -- modeled?
A. They are using low order models, mathematical models to describe turbulence. That's the meaning. I can explain more if you wish.
Q. Well, what -- what would be the alternative to them being completely modeled?
A. No. The alternative would be not to model it. This is modeled. The alternative would be not modeled, to be computed accurately. Model here means you take some physical information, you make an approximation. Modeled here means approximation. The word modeled here means approximation.
Q. Did you do any research with respect to hospital practices for cleaning and keeping operating rooms aseptic?
A. Never, and I don't wish to.

Q. Did you look at any hospital infection rates?
A. Not my job.
Q. Did you talk to any physicians --
A. No, never.
Q. Let me finish the question.
Did you talk to any of the physicians who've treated any of the plaintiffs in this case?
A. Never. I didn't know -- I don't know the plaintiffs. I don't know who.
Q. Did you communicate with any of the hospitals where any of the plaintiffs were --
A. Never.
Q. -- were treated?
Okay. Did you communicate your findings to -- about the -- the impact that your model shows the Bair Hugger would have on an operating -- on an operation, did you communicate those findings to the Federal Food and Drug Administration?
A. That's not my job. I'm a research guy, 24/7. I do --
Q. So you --
A. I do -- I do NASA, Navy, highly tech. This is not.
Q. So you've never --

A. No.
Q. Let me finish.
A. I don't wish to.
Q. Let me finish. Have you ever done any research that you submitted to the FDA?
A. Never. I don't wish to.
Q. So you haven't submitted anything about the Bair Hugger to the Centers for Disease Control either, right?
A. Not my desire. It's -- no.
Q. I'm -- you've never done research in the medical field --
MS. ANDREWS: Asked and answered --
BY MR. GORDON:
Q. -- other -- other than the respiratory stuff we talked about earlier?
MS. ANDREWS: Sorry. Objection. Form.
THE WITNESS: Medical field is a big field. I -- I cannot say I did medical field research, no.
BY MR. GORDON:
Q. And would it be safe to characterize your -- the bulk of your research as being related to things like rocket science?
A. Yes, if you can. Yes, yes.

[Reporter requests clarification.]
THE WITNESS: Yes, yes. Because he wants to say it. I said you can, yes.
BY MR. GORDON:
Q. And -- and I -- I -- from what you're saying, I infer that what you're saying is this -- this kind of stuff that you're modeling, it's not rock science?
MS. ANDREWS: Objection. Argumentative. Improper question.
THE WITNESS: I never.
MS. ANDREWS: You don't need to answer that. It's not a proper question.
THE WITNESS: I never --
MS. ANDREWS: You don't need to answer that --
MR. GORDON: What's the bas- --
MS. ANDREWS: -- when I tell you not to answer.
MR. GORDON: What's the basis for your instructing him not to answer.
MS. ANDREWS: It's an insult. It's an insult.
MR. GORDON: It's not an insult, Counsel.
MS. ANDREWS: Then ask properly.

MR. GORDON: And -- and whether -- whether it is or it isn't --
MS. ANDREWS: Ask your question.
MR. GORDON: -- you don't get -- you get to instruct your witness to not answer --
MS. ANDREWS: Ask another question.
MR. GORDON: -- privilege questions.
MS. ANDREWS: You are insulting the witness. I stand on that and ask another question.
MR. GORDON: Well, actually, I'm not insulting the witness and you're -- I -- I --
MS. ANDREWS: It's your opinion.
MR. GORDON: -- I don't appreciate your interpretation of my questions.
MS. ANDREWS: That's fine. But I do, and I am standing on my objection. Ask another question and make it a nice one and a proper one.
MR. GORDON: Counsel, in the -- in the nice contest, trust me --
MS. ANDREWS: Push -- you start making physical --
MR. GORDON: -- you're not a competitor.
MS. ANDREWS: -- gestures to me, sir --
MR. GORDON: That --
MS. ANDREWS: -- you will be -- you will

be sa- -- you will be --
MR. GORDON: There was no physical gesture to you. Stop that nonsense.
MS. ANDREWS: You stop it. You're using your hands --
MR. ASSAAD: I think -- let's take -- we're off the record. Let's take a break. Let's take a five-minute break. You guys need to cool down. Let's go, five-minute break.
MS. ANDREWS: Your gestures --
MR. GORDON: Yeah. Take it off.
THE VIDEOGRAPHER: Off the video; 4:32.
(Recess.)
THE VIDEOGRAPHER: Back on the video record 4:33.
BY MR. GORDON:
Q. Dr. Elghobashi, I -- I'm convinced by plaintiff's counsel that my last line of questions were -- didn't come across as I intended them to. I certainly did not mean any disrespect to you, sir, and I want to make that very clear.
The point I was trying to make was your career has been in very high levels, literally rocket science, and I have the deepest respect for that. And I was perhaps being a little bit too

clever in trying to say that what -- anything that isn't rocket science -- it's kind of a colloquial joke, you know, well, it ain't rocket science. I wasn't -- didn't mean you any disrespect, sir.

A. Okay. The same equations used for rocket science are identical equation used for operating room. Both same complexity, yes.

Q. So an operating room CFD would be as complex --

A. Correct.

Q. -- as rocket science?

A. Because the same equations are used. It's called Navier-Stokes equations.

[Reporter requests clarification.]

THE WITNESS: Navier-Stokes.

BY MR. GORDON:

Q. Isn't Navier-Stokes an equation essentially used in almost all fluid modeling?

A. Correct.

Q. So is there any simple system to which Navier-Stokes wouldn't apply?

A. Never. Fluid -- all fluid mechanics use Navier-Stokes equations.

Q. Okay. So is there something -- well, I'll let that pass.

A. I can -- rocket science, if there's rocket combustion, there would be additional equations that do not -- are not needed in the operating room, but Navier-Stokes would be the same in a rocket and operating room. Any complexity and rocket science would be additional equations: Chemical reaction, compressibility, mach numbers, things like that.

[Reporter requests clarification.]

THE WITNESS: Mach number, M-A-C-H number. Yeah.

BY MR. GORDON:

Q. Thank you.

If you'd turn to page 10 of your report, Exhibit 12.

A. Yes.

Q. In the Figure 3, you have a depiction --

A. Yes.

Q. -- of the BH blower --

A. Correct.

Q. -- in a box.

MS. ANDREWS: 10.

BY MR. GORDON:

Q. Is -- are those dimensions that are reflected on the drawing, are those intended to be the entire Bair Hugger?

A. Could you repeat again.

Q. Well, do you know how tall the Bair Hugger is?

A. Yeah.

Q. How tall is it?

A. I mean, the machine itself is here (indicating), like that height, and then a hose and then a blanket.

Q. So -- well --

A. Like this is a schematic. This is not real.

Q. No, I under- -- -- let me ask the question a different way. The scale that's drawn here would suggest that the height of this object that you've identified as the BH blower is about .7 meters, right?

A. Right, that's -- yeah, yeah.

Q. A little over, like --

[Reporter requests clarification.]

BY MR. GORDON:

Q. A little over two feet, 2.3 feet?

A. Uh-huh.

Q. Is that your understanding as to how tall the Bair Hugger is?

A. No, the Bair Hugger is lower than that.

Q. Do you know how much lower?

A. About 30 centimeters, so 30... foot something, around a foot and few inches.

Q. So which part of this drawing is the actual Bair Hugger unit?

A. Could be the lower part or something. It says "schematic," so it does not -- yeah.

Q. What -- well, who -- first of all, who created that schematic?

A. It's from the CAD that was created before -- before the team -- before the simulation, yeah.

Q. And who did the inputs to the computer to generate the CAD?

A. Okay. We had a CAD from -- we had the CAD from a company in Rochester for -- we added things to the CAD to allow for the Bair Hugger to be in. So we had a CAD before -- for a generic room, and we changed the dimensions to match 3M dimensions.

Q. Okay. What I'm just trying to understand is, is this depiction showing the Bair Hugger on the bottom with something else sitting on top of it --

A. Right.

Q. -- or the Bair Hugger on top sitting on something else?

A. Right, it's -- the Bair Hugger should be the bottom one, yeah.
Q. So what would be -- what's this depicting on top?
A. Yeah, I have to look back to see what it is, yeah.
Q. Page 28, line 492 -- 491, where you say, "To minimize the effect of boundary conditions, it is necessary to impose a proper, fully developed turbulent form field at the -- it's page 31 -- inlet?
A. Yes.
Q. Does that refer to, on page 30, Figure 12, the schematic of the inlet that's drawn off to the right?
A. Correct. So the duct would be the one on the right, and it should fit on the top of the black rectangle.
Q. And by "fully developed," you mean it -- essentially it's treated by the computer as if it's going off into infinity?
A. No. Fully developed in a pipe or a duct. It's a distance from the inlet -- like the inlet can come from anywhere: A nozzle or anything, and after a while the velocity profile takes a form that

doesn't change even if you increase the pipe length --
[Reporter requests clarification.]
THE WITNESS: If you do not increase the pipe length.
BY MR. GORDON:
Q. Well, in order for the model to be -- to incorporate a fully developed --
A. Uh-huh.
Q. -- flow at the inlet, doesn't it assume that the duct through which it is coming has no bends in it?
A. No, no. It's the -- that part should be straight, and anything beyond that could be bend, could be T-junction or anything; it doesn't matter.
Q. What's the height of the duct that need --
A. You --
Q. Let me finish.
A. Okay.
Q. -- that needs to be straight before there could be any bends?
A. So the length over the hydraulic diameter of the duct would be around 20.
Q. 20 times the diameter? I'm sorry?
A. Yeah, about 20 times the diameter, yes.

But this is -- the hydraulic diameter or rectangle. You make a circle of that.
Q. Okay. So you -- do you have a -- do you know what the dimensions are of the duct that your model assumed?
A. It's identical to the hole in the ceiling.
Q. The length of the duct?
A. No, no. The cross-section -- the black is the black.
Q. Okay. And I -- what I'm asking about is from the duct in the ceiling up into the ventilation system, how -- how long -- how high was that, straight --
A. Okay.
Q. -- without any bends?
A. This is -- this length of a duct (indicating), say let's assume it's 10 time the width of the duct, assume.
Q. Okay.
A. This is only a mathematical tool -- excuse me -- to get a velocity profile --
[Reporter requests clarification.]
THE WITNESS: Velocity profile, that is simulate reality. Because if you don't have this, what people do, they put some approximation to what

goes in here, and that's incorrect. This is the right way to do it.
BY MR. GORDON:
Q. Do hospital HVAC systems, do they have bends in them that are -- would be --
A. Okay.
Q. -- shorter than this?
A. Okay. This is not an actual hospital duct above the operating room. Otherwise, you will have no ceiling -- I mean, it goes -- right?
Q. Otherwise it would have? I'm sorry?
A. No ceiling.
Q. No ceiling.
A. This is a technique of providing a realistic velocity profile at the inlet. If you don't --
[Reporter requests clarification.]
MR. GORDON: Velocity profile at the inlet.
THE WITNESS: At the inlet. I'm sorry.
MR. THORNTON: You might want to speak up for the court reporter. I think she is having trouble hearing you.
THE WITNESS: I'm sorry, I'm just -- have to look.

Are you waiting for me or --
BY MR. ASSAAD:
Q. I --
A. Okay. So what people do, using commercial codes, they ask them about some intensity and length scale and they put some numbers and get it. This is the right way to do it, trust me. This is -- will give you a velocity profile almost flat that mimics the grille.
[Reporter requests clarification.]
THE WITNESS: Flat. See the outline here (indicating)? Correct.
THE REPORTER: Grill?
THE WITNESS: Correct.
So if you don't do this, you will get some incorrect profile. This is the right way to do it. 00at's how we teach people.
BY MR. GORDON:
Q. Okay. Go back to page 31; you were just on it --
A. Okay.
Q. -- if you would.
And at line -- well, there is no line number after 504 on this page, but --
A. Okay.

Q. -- right after that.
A. Okay.
Q. It says that "the Bair Hugger draws air from the floor of the operating room, heats it and blows it into the blanket.
[Reporter requests clarification.]
MR. GORDON: Draws air from the floor of the operating room, heats it and blows it into the blanket.
BY MR. GORDON:
Q. When you say that the Bair Hugger draws air from the floor, what's the area that you are describing there?
A. I had -- the Bair Hugger is -- had a little grille in the bottom. I don't remember the dimensions. Could be few inches rectangle, something like that. I looked at it before we did this.
Q. And your model assumes the Bair Hugger is sitting on the floor?
A. With a height. There is -- the Bair Hugger has wheels, and this -- I don't remember the dimensions, but it would be one inch or two inches, so -- otherwise if it's sitting on the floor, there will be no suction, right? If the filter or the

Bair Hugger on the floor, there would be no suction.
Q. Okay, but it's -- your model assumed that it was right on the floor but for its, what you're describing as the wheels?
MS. ANDREWS: Objection. Mischaracterizes the testimony.
THE WITNESS: We measure the Bair Hugger. We lift it from the floor in the model as the Bair Hugger has. I don't remember the dimensions. It's not a meter; it's not a half a meter. It's small.
BY MR. ASSAAD:
Q. Did you do anything to check to see how Bair Huggers are actually used in operating rooms?
A. We were in operating room in Santa Monica. We had an actual 750 Bair Hugger.
Q. Who set it up?
A. The lady, the RN.
Q. So you relied on her to be setting it up the standard way; is that right?
A. Her job, yes, that's correct.
Q. Did you do any independent research to see if there are other ways of setting up the Bair Hugger?
A. Never.
Q. Did you notice that the Bair Hugger had a

clamp on the back?
MS. ANDREWS: Objection. Vague and ambiguous.
THE WITNESS: I don't remember. I did not check.
BY MR. ASSAAD:
Q. As you sit here today, are you aware of the Bair Hugger ever being used -- either suspended using that clamp on an IV stand or some other elevated plate?
A. I have seen pictures of that, yes, I do.
Q. Your model does not treat the Bair Hugger as being elevated in that way --
A. Correct.
Q. -- is that correct?
A. That is correct.
Q. Your model assumes that the air is discharged along the edges of the drape uniformly, correct?
A. Correct.
Q. And would the correct term for describing the way the air emerges be a slot jet?
A. Uniformly distributed along the edge. The velocity comes from the blower mount. Mass flow rate divided by --

Page 202

[Reporter requests clarification.]
THE WITNESS: Mass flow rate divided by the area of the edges of the drape.
BY MR. GORDON:
Q. Right. And but it's -- is that -- does the term "slot jet" have any meaning to you?
A. Yes, of course, yes.
Q. Is what you're describing a slot jet?
A. Okay, but it's -- it's a long -- if you wish, it's a long slot jet. It's along the edges. I mean, the slot jet usually, you know, something like this (indicating). This is distributed uniformly of a length, yes.
Q. Okay. Have you ever known anyone who has had surgery with a Bair Hugger?
A. No.
Q. Did you do any research to see what other pieces of equipment might be used in an operating room that generate heat?
A. I know there could be other machines, but I didn't do research on it.
Q. The same question with respect to machines that could generate air currents, did you do any research there?
MS. ANDREWS: Incomplete hypothetical.

Page 203

Form.
THE WITNESS: Question again, please.
BY MR. ASSAAD:
Q. Did you do any research to see if there were other pieces of equipment used in operating rooms that generate air currents?
MS. ANDREWS: Air currents?
MR. GORDON: Yes.
MS. ANDREWS: Same objection.
MR. ASSAAD: You can answer.
MS. ANDREWS: I'm sorry, you can answer.
THE WITNESS: Oh, I can answer? I thought you --
MS. ANDREWS: Forgive me.
THE WITNESS: Okay. The question is -- repeat it. Did I do any research on other devices in an operating room that blow air? Is that correct? No, I did not.
BY MR. ASSAAD:
Q. Or generate air currents, I guess is what I said.
A. No.
Q. Okay. So your model doesn't consider any other sources of air movement other than the HVAC system and the Bair Hugger; is that correct?

Page 204

MS. ANDREWS: Objection.
THE WITNESS: The lamp, the surgical lamp, has higher temperature than the ambient air that creates plume air movement, but because it does not have a blower in it, it's just by buoyancy.
BY MR. ASSAAD:
Q. And thank you. My question is limited to mechanical movement of air, not thermal convection.
[Reporter requests clarification.]
MR. GORDON: Convection.
THE WITNESS: I did not include the computer that has a fan or other device that has fans.
[Reporter requests clarification.]
THE WITNESS: That has a fan. That have a fan, yeah. Yes.
BY MR. GORDON:
Q. Okay. And in terms of heat sources, the only ones that you included in your model were the -- was it two surgeons and --
A. Four...
Q. Four surgeons, two lamps?
A. Two lamps, yes.
Q. And a patient?
A. And the blower.

Page 205

Q. And the blower.
A. Correct.
Q. Those are the only heat sources?
A. Correct.
MR. GORDON: Thank you.
MS. ZIMMERMAN: Are you done?
MR. GORDON: Uh-huh.
MS. ANDREWS: Sorry, are you finished?
MR. GORDON: Yep.
MS. ANDREWS: Okay. We need a few minutes.
MS. ZIMMERMAN: We'll be back in just a few.
MS. ANDREWS: Let me hand you this note.
THE VIDEOGRAPHER: Off the video at 5:04.
(Discussion off the record.)
THE VIDEOGRAPHER: Back on the video record 5:16.
EXAMINATION
BY MR. ASSAAD:
Q. Dr. Elghobashi, my name is Gabriel Assaad, and I represent the plaintiffs in this case. And you and I have met before, correct?
A. Yes.
Q. Okay. And we asked -- and we retained you

to do a computation of fluid dynamics study of the Bair Hugger in operating room?
A. Yes.
Q. Okay. You were asked questions regarding whether or not you considered other devices in the operating room when you performed your analysis. Do you remember those questions from defense counsel?
A. I do.
Q. Okay. And you said you didn't consider them, correct?
A. Correct.
Q. Why didn't you consider them?
A. I focused, excuse me, on the devices that will have the main impact on the flow on the operating, on the -- yes.
Q. Okay. When you said you want the focus on the device, you're talking about focusing on the Bair Hugger, correct?
A. Yes, the Bair Hugger and the -- the whole setup. I took the main ingredients that matters for this flow, like devices that are far away and would have little impact on the results.
Q. If any, correct?
A. Correct.
Q. Okay. And by -- and correct me if I'm

wrong, but I understand when people do research, they try to -- they don't want to have too many variables so they could determine how one variable acts on the environment. Does that sound correct?
MR. GORDON: Object to the form of the question.
THE WITNESS: It's too general, but if you want to do research, you have to focus in the main ingredients that matter, yes.
BY MR. ASSAAD:
Q. Okay. And I'm going to jump around a little bit because we are going to try to get out of here.
Earlier today you were talking about the measurements you took at Santa Monica. Do you remember those discussions?
A. Correct.
Q. And your response was: To do, like, temperature and velocity measurements you needed instruments and preparation?
A. Correct.
Q. Okay. What did you mean by that?
A. I meant it will cost you more than a million dollars.
Q. Why?

A. Because PIV need four cameras for 3D and two laser sheets and a lot of equipment for storage and trained personnel; all of them must have many PhDs, yeah.
Q. And have you done that in the past?
A. I have not.
Q. But have you done -- have you read research and people doing that in the past?
A. Yeah, I know who -- who are the best in the country.
Q. Okay. And you're familiar with the cost of how much that will cost?
A. Definitely.
Q. Okay. And when you do take measurements, does it make a difference if a person is tak- -- doing it by hand as compared to it being done by computers and PIV?
A. These days, yes.
Q. Why?
A. For accuracy you need 3D measurements --
[Reporter requests clarification.]
BY MR. ASSAAD:
Q. Just repeat your answer. For accuracy?
A. For accuracy, accuracy, yes; for accurate measurements you need qualified people to do the

measurements, and I'm not talking about flow visualization, like sheering and all this. I want people to measure three dimensional velocity components, U, V and W, the function of time and space, and then you can do proper comparison.
Q. People in your field, do they use a hot wire anemometer to take temperature and velocity measurements to validate a CFD study?
A. Not these days.
Q. Why not?
A. Because they're not accurate.
Q. Okay. And the fact that someone is in the room taking that measurements, does that change the results of those measurements?
A. Invasive, you don't not need invasive --
[Reporter requests clarification.]
MR. ASSAAD: Invasive.
THE WITNESS: Invasive.
[Reporter requests clarification.]
THE WITNESS: You -- it should be noninvasive technologies, yes.
BY MR. ASSAAD:
Q. Okay. And when you give a noninvasive, where no one else is in the room, correct?
A. Right.

Q. Why?
A. Because disturbances by moving objects will give you different results any time. So you want to make it pure measurements, you have to have PIV, for example, yes.
Q. Would you consider a measurement to validate a CFD model or study by a hot wire anemometer reliable?
A. No.
Q. And let's talk about the code. Explain the code that you used from Stanford. Well, let me withdraw that. That's very broad.
Who created the code?
A. 15 PhDs at Stanford.
Q. And has the code been evolving?
A. Definitely.
Q. Okay.
A. Tested -- validated every year through that, yes.
Q. And when you say you were validated every year, is -- has it been validated with more complex models than what was done here in this case?
A. Validated?
MR. GORDON: Object to the form of the question.

THE WITNESS: Validated with more complex flows? It's validated with simple to far complex. Starts from a channel flow called isothermal flows.
[Reporter requests clarification.]
MS. ANDREWS: Channel flow. Isothermal flow.
THE WITNESS: Then swirling flows, which is very complex. No RANS code can do it.
[Reporter requests clarification.]
THE WITNESS: RANS, R-A-N-S. That's an abbreviation.
And then went into particle-laden flows, droplet-laden flows, chemical area acting, swirling droplet flows. These are used for Pratt & Whitney for jet engines. So 15 years of development, every step of the way you validate it with experiments from Pratt & Whitney, from Germany, from Cambridge, all the way. Then after we have a code like this, you know what you're getting.
BY MR. ASSAAD:
Q. And you know that when you -- the -- the model or the fluid flow that the code generates is accurate and valid?
A. Absolutely.
Q. Okay. And who has access to this code?

A. The PhD students who developed it over the years, they have access; post docs and I have access now because I work with them.
Q. And is the code accurate?
A. Yes.
Q. Is it reliable?
A. Yes.
Q. Is it valid?
A. Validated, yes.
Q. And when you say "complex," can you give me real life examples where this code has been validated?
A. So if you have a combustion chamber in a jet engine, like, say, for -- that's used for 737 or 767, it has a spray nozzle that sprays liquid droplets. They evaporate -- evaporate. They mix, they burn. And Pratt & Whitney measures temperature, velocity accurately. And you compare with them, and the paper -- published paper show accurate comparison.
Q. Okay. And let's -- and we've mentioned the word -- the code like ANSYS. Are you familiar with ANSYS?
A. Yeah, I use it for undergraduate teaching.
Q. Okay. You don't use it for your graduate

students?
A. Never.
Q. Why not?
A. When you teach graduate students to do research, they have to know every line in the code, so they know what boundary conditions, what mesh, what they validate. ANSYS does not give you that chance. We teach --
[Reporter requests clarification.]
THE WITNESS: Does not give you that chance. We teach it for undergraduate only. I created the course for them to get a job in industry because industry -- all the industry in the US and abroad, they use ANSYS, and therefore, I wanted them to be ready to use it, but they do not know what's behind. Just buttons, click, click, click. So that we don't -- for graduate we cannot do that.
BY MR. ASSAAD:
Q. With respect to -- and what you did in your report, did you model air flow or did you model particle movement?
MR. GORDON: Object to the form of the question.
THE WITNESS: We -- we simulate. We solve equations for the fluid flow, turb- --

[Reporter requests clarification.]
THE WITNESS: Equations -- E-Q-A -- for the fluid flow, and after that we solve the individual -- the equation for individual squame, one by one for 3 million, to follow where they go accurately.
BY MR. GORDON:
Q. And when you follow the -- when you follow the particles, did you use the -- the Euler method or the Lagrange?
A. Lagrange method.
Q. Do you know whether or not ANSYS uses Lagrange or Euler?
A. I do not know.
Q. Based on your experience in the use of ANSYS and teaching it to your students, can ANSYS give you an accurate solution to the problem of what you did with respect to the Bair Hugger in the operating room?
A. Not in a million years.
Q. Can you explain why?
A. In one of the projects for the undergraduate students, we teach them how to predict turbulent pipe flow. This is homework number two. And so turbulent pipe flow is a very well known

flow. It's been measured by many people. The most important experiment was done from Professor Laufer at CalTech.
Laufer L-A-U-F-E-R, in the 1950s. The best supported by NASA. And Fluent cannot predict the experiment of a simple turbulent pipe flow. Error is quite large errors.
Q. And that's based on your current understanding of Fluent and what you teach in class, correct?
A. Correct.
Q. Okay. So based on what you know about Fluent, would Fluent be reli- -- ANSYS Fluent or ANSYS CFX be reliable in solving particle movement in operating rooms such as you did?
A. Never.
Q. Is it accurate?
A. No.
Q. Would people in your field that do what you do use a software such as ANSYS Fluent or ANSYS CFX to solve particle flow in any situation?
MR. GORDON: Object to the form of the question. Also lack of foundation.
THE WITNESS: The people I'm aware of who are top researchers in the world do not use ANSYS.

BY MR. GORDON:
Q. Because you mentioned -- you said ANSYS is a black box, correct?
A. Because of that, yes.
Q. When you say "black box," what do you mean?
A. You do not know when you select a model from the choice menu -- ANSYS has menus. Menu.
[Reporter requests clarification.]
MS. ANDREWS: ANSYS has a menu.
THE WITNESS: ANSYS. And if you select a menu for a certain model of a certain physical phenomena, you do not know how this is executed.
BY MR. GORDON:
Q. Okay. Would you allow any of your graduate students or PhD students to use ANSYS or Fluent?
A. Never.
Q. All right. With respect to -- okay. I want to talk about the methodology with respect to your conclusions. Okay. My understanding is that you create a geometry, correct?
A. Correct.
Q. How do you create the geometry?
A. We use CAD and we set --

[Reporter requests clarification.]
THE WITNESS: CAD.
THE REPORTER: I heard that.
[Reporter requests clarification.]
THE WITNESS: We do the setup.
BY MR. ASSAAD:
Q. And that's a 3D geometry, correct?
A. Correct.
Q. And then what's next? What do you do after you do the CAD geometry?
A. We create a mesh.
Q. What is a mesh?
A. You -- you divide the volume of the room into small volumes in which you solve the equation locally in time and space, 3D.
Q. Okay. And is the setup of the mesh crucial in the solution of the problem?
A. Essential.
Q. Essential, okay.
And you created a chart in your -- with respect to your mesh -- first of all, you showed the mesh in you diagram on page 27, correct?
A. Correct.
Q. And explain the mesh. Are they just little squares? Are they circles? What are they?

A. They're a combination of hexagon, tetrahedrons and pyramid -- pentagon -- yeah.
[Reporter requests clarification.]
THE WITNESS: Pentahendral -- okay. Hexagon, pentahedral, tetrahedral, yes.
BY MR. ASSAAD:
Q. Okay. And why are they different -- why are there different --
A. Because --
Q. -- shapes?
A. Because in a complex geometry and you want to know the flows near the head of the patient, you want to -- the mesh to form according to the shape your -- to the geometry you're having, yeah.
Q. Okay. And in creating the mesh, do you put a more finer mesh in certain areas --
A. Absolutely, yes.
Q. -- as compared to other --
A. Yes.
Q. Why would you do that?
A. To capture details of the flow and temperature in critical zones.
Q. So if I understand you correctly, the more critical zone, or where you want to find what's really going on, you make a finer mesh?

A. Correct.
Q. Okay. And then can you explain -- did you do that in this case --
A. Absolutely.
Q. -- in this model or this --
A. It's an essential -- it's like this -- essential.
Q. Okay. Let's go to page 29. And there's something called mesh skewness and mesh aspect ratio.
A. Correct.
Q. What is that -- what is the meaning of that for someone that's a layman like myself and everyone else here in this room?
A. Okay. I know. It's -- in order to solve the three-dimensional Navier-Stokes equations and energy equations, you have some rules; in that subject, you have some rules. For example, if you have a mesh that looks like a spaghetti for one cell, that will remove certain terms from the equation by error. So you should not have -- so we aspect ratio, how long compared to the width or -- so you have always to check the aspect ratio, each cell, to make sure you're not violating the rules of the subject flow -- of the simulation.

Q. And just, by the way, the methodology that you used in solving this problem, is this the same methodology you've used in other problems?
A. Yes, it's a standard methodology.
Q. And do you know whether or not it's the same methodology used by other people in your field that do what you do?
A. I cannot judge for other people. The good people do that.
Q. Okay.
A. The top people.
Q. The people that you work with at NASA and the Navy and with the NIH, are they the type of people that would use the same methodology as this?
A. Right. I'm talking about people in academia do that work. I don't know about government agencies. But usually the government agency ask university to do the important work, and the people who do the important work for government follow that procedure.
Q. I want to jump back, and there was a time when you were asked questions about the boundary conditions.
A. Yes.
Q. Okay. And you kind of -- you kind of

mentioned that it's what you did, like you just thought about it a lot?
A. Correct, yes.
Q. Okay. You didn't just come up with something out of the blue, correct?
A. No.
MR. GORDON: Object to the form of the question.
BY MR. ASSAAD:
Q. Okay. It's not something that you just pulled from thin air, correct?
A. No.
Q. Can you explain what you meant by when you thought a lot about the boundary conditions, what type of mental and mathematical process you went through in your mind?
A. You have to apply certain equations of motion of air over a flat plate and --
Q. What type of equations?
A. Still Navier-Stokes. Navier-Stokes are the equations used everywhere.
Q. Okay.
A. And that will allow you to judge whether the temperature of the edge of the drape is, say, 41 degrees if you have start from 42 or something,

yeah.
Q. So are these actual calculations you just jotted down or calculated?
A. Sometime -- sometime before we do the boundary condition, yes.
Q. Okay. And when you -- are these the type of calculations you do to solve problems in many of the -- much of the work that you do?
MR. GORDON: Object to the form of the question.
THE WITNESS: Standard, yes, standard.
BY MR. ASSAAD:
Q. Let me rephrase it. I'm not sure I understand the basis of the objection, but I'll try to rephrase it. When -- when you create boundary conditions in a -- in a model that you're going to solve through CFD, do you go through a mental process to determine the boundary conditions?
A. Always.
MR. GORDON: Object to the form of the question.
MR. ASSAAD: Basis...
Oh, you don't have one?
MR. GORDON: Are you asking me?
MR. ASSAAD: Yeah.

MR. GORDON: It's leading.
MR. ASSAAD: Okay.
BY MR. ASSAAD:
Q. What do you do establish boundaries conditions?
A. You look at the physics of the problem, and there are rules for boundary condition: What type... Either they're Dirchilet or Neumann.
[Reporter requests clarification.]
THE WITNESS: Okay. D -- yeah, D-I-R-C-H-I-L-E-T, Dirchilet, and Neumann, N-E-U-M-A-N-N.
BY MR. ASSAAD:
Q. Then are these -- did you perform those calculations in your calculations of boundary conditions?
A. These are rules you follow for setting up the boundary conditions.
Q. Okay. And are those the rules that you follow?
A. Yeah, it's --
Q. Okay.
A. -- a standard thing, yeah.
Q. And you followed it in this -- in this analysis?

A. Yes, it's the nature of it. You have to do it by nature, yeah.
Q. Okay. Now, you've read Mr. Abraham's report, correct?
A. Could you refer it to me. I don't know which one.
Q. You've read the report of -- which is marked as Exhibit -- I'm sorry -- Dr. Abraham's report.
MS. ANDREWS: Dr. Abraham's...
MR. ASSAAD: I apologize.
THE WITNESS: Can I see it?
MS. ZIMMERMAN: It's not written on it, is it?
MR. ASSAAD: It's Exhibit 17, I think; isn't it?
MS. ZIMMERMAN: 18.
MR. ASSAAD: 18. You have it right there? No.
MS. ANDREWS: You do.
MS. ZIMMERMAN: Should be the last one, the last one.
MS. ANDREWS: Here it is. Sorry. They're out of order.
THE WITNESS: I have to read it all? So

you tell me which page.
BY MR. ASSAAD:
Q. But you definitely recall -- did you read his critique of you?
A. Not all of it. Just the seven items.
Q. Okay. Before we get to the report, I want to talk about that for a little bit.
A. Yes.
Q. You have seen his CFD video online on YouTube, correct?
A. Correct.
Q. And do you know whether or not that was done RANS or LES, the first video?
A. In my opinion, it was RANS.
Q. Okay. And then it seems like he ran a second model based on his report and he used LES, correct?
MR. GORDON: Object to the form of the question. Lack of foundation.
THE WITNESS: I think in this report somewhere it says it used to be RANS and later they used LES. I think. I think.
BY MR. ASSAAD:
Q. Okay.
A. I gotta read it carefully, but I think I

remember that.
Q. Now -- oh, real quick: Do people in your field, when they have a mesh, inform -- when you solve the problem how many --
A. Mesh points.
Q. -- how large the mesh is?
A. The number of cells.
Q. The number of cells, yes.
A. It's essential.
Q. Why is it essential?
A. Because you have to do something called grid independence test. Grid independence means you repeat the same flow computation with successively finer mesh until the results, each to become independent of more refinement. It's called --
[Reporter requests clarification.]
MR. ASSAAD: More.
THE WITNESS: More refinement.
BY MR. ASSAAD:
Q. And did you do that in this case?
A. Yeah, in all -- that's the standard. We teach undergraduate to do that.
Q. Okay. Did you see that anywhere in Dr. Abraham's report regarding whether or not he did that or the size of his -- how many cells are in his

mesh?
A. Again, I just looked at the pictures. I didn't look -- read what he used.
Q. Okay. If you go to page 4 of his report --
A. One four? Just four, I see it, yes.
Q. If you look under step two, analysis, calculations of cells --
A. Yes.
Q. -- the second sentence says, "Larger number of grid cells result in a more accurate solution." Do you agree with that?
A. Could you tell me where this is.
Q. Large...
A. Oh, this top here (indicating.)
Q. Yeah.
A. I read it. That's the first time I read this. "The next step..."
Q. You can read it to yourself, though, so it's not --
A. "-- is to substitute..."
MS. ANDREWS: Read it to yourself.
THE WITNESS: Oh, I'm sorry. Okay. The first sentence is correct, it's fine.
BY MR. ASSAAD:

Q. Okay.
A. So what --
Q. The next -- sorry, I'm going to go to the sentence that says, "Large number of grid cells result in more accurate solution." Do you agree with that?
A. So in general, larger number of cells in a refinement, refinement, yes, it should produce that.
Q. Okay. In the calculations that are presented here, up to 60 million grid cells were employed and high accuracy was obtained. Someone in your field that's writing a report regarding a CFD and describing the mesh, would they give an approximation or would they give an exact number?
MR. GORDON: Objection to the form of the question. Also lack of foundation.
THE WITNESS: We give exact numbers.
BY MR. ASSAAD:
Q. Why is that important?
A. That's how we trained to do it: To report what you used. It's like an experiment; you report to say what you did.
Q. Is the mesh important with respect to the -- to the computer solving the CFD problem?
A. Yeah, definitely; it's a known fact.

Q. Okay. Now, were these -- were these -- when you put all this stuff in and you had the code, is this done on a regular computer?
A. It depends on the mesh. If you -- if you have a small mesh, you can use a set of computer connected in parallel, but if you have a very large -- it depends on the equation you're solving and the mesh -- number of mesh points.
Q. Let's talk about the computers that you used. Did you use your personal computer to solve this?
A. No, no, no.
Q. What computer did you use?
A. You use a super computer.
Q. And where is a super computer located?
A. In different national centers, like Illinois, Texas.
Q. Which one did you use?
A. I used the one in Texas.
Q. Okay. And with respect to your methodology and the super computers, I'd like you to explain how the problem is solved using super computers with the Navier-Stokes equations and relative to the mesh size -- mesh size. Does that make sense or --

Page 230

A. Well, I give an example, but not everything done this way, but you can divide the number of cells in different processors.
Q. Okay.
A. So you know, certain zones in the flow are -- sorry, if you have 10,000 processors, you divide this so they can interact with each other. That's how to do that, parallel.
Q. And the amount of computer time, is that called CPU time?
A. Correct.
Q. How much CPU time was used to solve this problem with respect to the Bair Hugger in the operating room?
A. Total or per one or --
Q. Per run, per scenario. I mean, if it's in report -- I'm not sure if it is or --
A. Yeah, I'm just looking, because we make many runs, I cannot recall. Hundred thousand CP hours. Called CP hours.
Q. Is that in your report somewhere? If not, it's okay.
A. Yeah, that's okay.
Q. Can you validate your results with Schlierin testing?

Page 231

A. No.
Q. Are you familiar with Schlierin testing?
A. Yes.
Q. How are you familiar with Schlierin testing?
A. When I was an undergraduate, I used to do experiments using Schlierin testing.
Q. And why can't Schlierin validate CFD, in your opinion?
A. Schlierin is a visualization technique. It will tell you which part is hot, which part is cold. But it doesn't give you velocity or temperature or anything like that.
Q. Okay. And as the -- would you agree with me as the delta temperature -- the delta of the temperature decreases, Schlierin is -- it's more difficult for Schlierin to pick that up?
MR. GORDON: Object to the form of the question. Also leading.
THE WITNESS: Yeah, if the temperature variation in a given zone is small, then the density gradients will be small and therefore Schlierin will not do.
[Reporter requests clarification.]
THE WITNESS: Will not do well. I'm sorry

Page 232

for all this.
BY MR. ASSAAD:
Q. So you agree with me that what -- would you consider Schlierin a reliable test with respect to air flow?
MR. GORDON: Object to the form of the question.
THE WITNESS: Schlierin will give you visualization to what's happening in the flow. It's a good visualization technique. It just -- it can put a candle. It can put your hand. You can put hot and cold, and you will see that you can use it for -- yeah, it's a good visualization technique. It will show you what's happening, but cannot tell you how much.
BY MR. ASSAAD:
Q. Can it show particle movement in a -- in a turbulent flow?
A. Okay, Schlierin measures temperature -- density gradients.
[Reporter requests clarification.]
MR. ASSAAD: Gradients.
THE WITNESS: Density gradient.
So it depends on the -- how hot the particles or how cold. I mean, yeah, it's -- I

Page 233

have -- I'm not aware; it could have been done. But you need a lot of -- it just measures density gradients created by temperature variation.
BY MR. ASSAAD:
Q. Let's talk about the 10 micron spheres.
A. Okay.
Q. Are you saying that a squame is a 10-micron sphere?
A. I am saying if you put a squame in an air flow, turbulent air flow -- an average squame, because squames vary from different sizes. We took an average -- then a sphere will be following the trajectory of that squame.
Q. Okay.
A. That's a known thing from 1850.
Q. When you say it's known from 1850, what do you mean? Who came up with that --
A. Stokes. He derived that.
Q. Is that the -- is that the Stokes from Navier-Stokes?
A. He -- yes.
Q. Okay. And note, the next equations that are -- that -- that --
A. He just --
Q. -- that are based on CFD, correct?

A. Okay. So if you want to -- if you want to mimic the motion of a small flat object in a turbulent flow and there is no equation in the world for the -- that shows you the development motion of a flat piece of flake, then it is the accurate way to do it: To convert it to a sphere in a way that the sphere and the flake will arrive at the same place at the same time if they are done properly.

Q. Okay. So if I understand it correctly, it has -- the 10 microns sphere has the same characteristics as --

A. Motion, dynamic characteristic, yes.

[Reporter requests clarification.]

THE WITNESS: Dynamic characteristic.

BY MR. ASSAAD:

Q. -- as a squame because that's the only way --

A. Yes.

Q. -- that science today could calculate the movement --

A. Yeah.

Q. -- of a particle?

A. The simple reason is there is no equation for a flat, small piece in a turbulent flow, none.

Q. Okay. And are you familiar with anyone

else that has used a 10-micron squame in an operating room to calculate the particle movement of a squame?

A. I think Memarzadek, I saw that, but I don't think -- I don't know where he got it from. He just assumed it.

Q. Okay.

A. But we computed it.

Q. And you computed it in your appendix and put --

A. Correct.

Q. -- it in your report?

A. Correct.

Q. And you were criticized by Dr. Abraham over here, sitting here right to my left --

A. Okay.

Q. -- at this deposition --

A. Okay.

Q. -- that the squame -- you didn't have the sphere rotating. Do you remember that criticism?

A. I do.

Q. Okay. What is your response to that criticism?

A. Again, I teach fluid dynamics.

[Reporter requests clarification.]

THE WITNESS: We teach fluid dynamics, so...

BY MR. ASSAAD:

Q. Now, remember, I'm not as smart as you, so try to simplify it as much --

A. Okay.

Q. -- as possible for me.

A. Okay. Okay. When you have a sphere rotating, it's subjected to Magnus effect, M-A-G-N-U-S. And that's a German physicist. And it will create a force, normal to the axis of rotation and the direction of the main flow.

However, in 1968 Professor Saffman, who was in England and later architect, showed there is -- a sphere moving in a sheer flow is subject to what's called the Saffman lift. There are many books and papers written about it. And it is essential for formation of sand dunes, for example, in the desert because that sand particle has to jump because it has to be lifted by saltation and you need a Saffman lift force to do that. So the Saffman lift force is an essential part of an equation of motion for nonrotating particles.

Q. Okay. And you took that into account in --

A. Definitely, because if the squames are on the floor, they have to be lifted some way. You need sheer to lift them.

Q. And when you measure particles, particle movement, do you use -- there's something called coupling, correct?

A. What do you mean "measure"? I don't --

Q. Or when you -- when you track particles or you -- you --

A. Yes.

Q. -- solve the problem.

A. Yes.

Q. Is there something called coupling? Like single coupling, double coupling?

A. Yes, yes, yes, yes.

Q. So what is that?

A. So, if you have a turbulent flow and you have a particle in it, if you have very few particles, then they would disbursed. Like, if you put some dust, they'll be disbursed by turbulent flow. However, if you put tons of them, they will affect the turbulence so it become two-way coupling. And if you put more --

[Reporter requests clarification.]

MS. ANDREWS: Two-way.

THE WITNESS: Two-way.
And if you put much more than that, you get four-way coupling. And they collide with each other in addition to the two-way coupling.
BY MR. ASSAAD:
Q. And is understanding the amount of cells in the coupling very important with respect to a way you solve particle movements?
A. Correct.
Q. Okay. And did someone -- do you know anyone that's written a paper with respect to a map?
A. Yeah, it's myself.
Q. Okay. And has it been named a certain type of map in the community?
A. They refer to it as Elghobashi's mop.
Q. Elghobashi map, okay.
And when did you come up with this map?
A. In 1991.
Q. Okay.
A. 1990.
Q. And how many times has this article been cited with respect to particle movement in turbulent flow?
A. I don't recall, but 900 or something like that.

Q. Do you know whether or not the Elghobashi map is taught in a -- in classrooms, in fluid dynamic classrooms?
A. For those people who teach particle in turbulence, they do it.
Q. Okay. And did you use the Elghobashi map with respect to --
A. No, because here the 3 million squames are so tiny, they -- just one-way coupling. It's not two-way coupling.
Q. That's when -- that's what I'll get to next.
You're talking about five percent of the squames hit a solid object?
A. Correct.
Q. Okay. And did you take into account the elasticity of the squames?
A. No. We -- so we did a solid sphere hitting a solid. We're just specularly moving, yeah.
Q. In your -- in your expert opinion, do you believe that to have a solution, a computation that leads to solution in this case, they need to consider elasticity of the squames?
A. The main object of this -- we did not know

the resolve. We thought, let us see -- put 3 million and see what will happen. We -- any particle collides with it, we will remove it because we don't care about it. We want to see if any of them arrive at that location. Until the very end we did not know.
Q. Okay.
A. So we neglected nonessential stuff. We keep only what matters.
Q. Okay. And -- and -- and is it -- there was some talk about, you know, 3 million being two percent of the squames. Do you --
A. Right.
Q. -- remember that?
A. Right.
Q. Can the -- the analysis that you did, could you run it with 50 million squames?
A. Yes.
Q. Okay. How long would it take to do that?
A. It will take more because very -- the -- the particle computation takes more than the fluid computation.
Q. What percentage does the particle computation take?
A. Sometimes it takes 70 percent.

Q. Okay.
A. Because you track each one each microsecond everywhere. That takes a long time.
Q. Is the -- is the model that you -- or the code that you used in this -- in your computational fluid dynamics, in your opinion, the best code that could be used in science today?
A. Based on 15 years of validating by 12 or 15 PhD students, I think it's -- it's used now -- DOE supports it. Everybody supports it. It's an essential thing.
Q. What you say DOE supports it...
A. For jet engines. Fiber content.
Q. So you're telling me the DOE uses the code that you use for jet engines?
A. No, no, no; they ask us to run it.
Q. Okay. So the DOE asked you to run code for jet engines on this co -- on this --
A. Right. It's --
Q. -- on this code?
[Reporter requests clarification.]
BY MR. ASSAAD:
Q. So let me rephrase. Let me rephrase the question.
So the DOE -- people like you consult for

the DOE and use this code to run solutions for jet engines?
A. For example; for example, yes.
Q. Okay. You also have expertise in DNS, correct?
A. Yeah, correct.
Q. Okay. And you focus a lot of your research in DNS, correct?
A. Correct.
Q. And DNS is direct numerical simulation, correct?
A. Correct.
Q. Could you use DNS on a solution for this operating room?
A. No computer in the world today can handle it.
Q. And why not?
A. Because the Kolmogrov -- okay, the Kolmogrov, K-O-L-M-O-G-R-O-V, Kolmogrov scale is one millimeter in the operating room. And if you divide seven meter, there will be 7,000 millimeter by 7,000, by 3,000 for the height, 49 times three, it's about 140 something. Then 10 to the nine. 149 billion cells. No computer can do it. Not in the world: China, here, yeah.

Q. Let's go to Dr. Abraham's report.
A. This one (indicating).
Q. Let's go to his criticisms of you, and then I'm going to end with your criticisms -- criticism of his report. We'll go little by little.
A. Could you tell me which exactly --
Q. Let's go to page 16.
A. Okay. Yes. I have what I read in the report, only those. Elghobashi's include -- okay, I -- seven. I looked at the seven. I didn't read the reports.
Q. Okay. Well, I'll go to other parts of the report. I just want -- want you --
A. Oh, okay.
Q. -- to comment on --
A. Okay.
Q. Because this is our only chance for you to --
A. Okay.
Q. -- offer any criticisms.
A. Okay, okay.
Q. And I'm sure after you read his deposition, you might have more criticism of his report, but we don't have his deposition yet. It will be after -- in July.

A. Okay.
Q. His first criticism is: You performed no experiment to validate your model and so your conclusions are unconfirmed and unreliable.
A. I disagree.
Q. Okay. Why do you disagree?
A. Because if you want to do hundred percent validation, you need an experiment using PIV in a room, and nobody published that. So it's a good two -- you need a 2 million dollar to do it.
Q. And you mentioned your code has been validated by --
A. That's the first step. The second step of the -- in the absence of a PIV experiment in operating room, you go back to all the validation of all the flows that has the same physical ingredient of the operating room, or more.
Q. Okay.
A. Like, the operating room has no additional physics that is not in the validated thing with experiment in the past.
Q. Okay. So -- so if I understand you correctly, you're saying that since the code that you used have done more complex and there's no new physics or new -- new -- I guess no new physics,

that, because it's been validated in the past, it's valid now for your solution?
A. Correct, it's --
Q. What's the Taylor-Green vortex that has been used to validate the LES system that you used, the code that you used?
A. Okay. Taylor-Green vortex is a series of counter-rotating vortices that has an analytical solution, so that's -- when you validate codes, like for undergraduate, the first thing you do, you validate with the very few analytical solution from -- Navier-Stokes equation have no analytical solution except for very simple flows, laminar flows. So you tell the student: Go to the analytical solution in a pipe flow and do it and that's fine.
On -- Taylor-Green vortices have an analytical solution, which is more complex than a pipe flow, then you do that, so that's --
[Reporter requests clarification.]
THE WITNESS: Pipe flow, yes. And so on. You go systematically to all the canonical flows: Five channel; turbulent. You do all this, based on -- sometimes you use DNS, which is very accurate for these simple flows, and sometimes you do

experiment. But step by step, you validate for 15 years, and then you know it's good.
BY MR. ASSAAD:
Q. Has DNS ever validated this code that you used?
A. Yes.
Q. How many times, if you're aware?
A. Channel flow, sheer flow.
[Reporter requests clarification.]
THE WITNESS: Sheer flow. Channel flow. I have an accent.
Yes. Yeah, so you do that; that's essential thing. It's mandatory to do that for everything before you use it.
BY MR. ASSAAD:
Q. Before you use the LES code to --
A. Yeah. You have to test it, uh-huh.
Q. And is validating with DNS a type of validation accepted among your peers?
A. Yeah, because DNS is more accurate than experiment.
Q. Okay.
A. Because no human --
Q. So you're -- so you're saying that DNS is more accurate than an experiment?

A. For a -- for a small number of flows because no computer can handle the room, right?
Q. Okay.
A. So the channel, sheer flow, things like that. So you know the code can handle that.
Q. Okay.
A. This is turbulent flow; it's not laminar.
Q. On number two, Dr. Abraham writes, "The expert does not clearly define how the Bair Hugger heated air entered the room. From the incomplete description given, it appears that he has made a serious error by allowing the heated air to emerge along a slot at the edge of the drape. This assumption is in stark contrast to what happens during actual use of the Bair Hugger device and invalidates his analysis."
What is your response of that criticism by --
A. We discussed this today at length. All the air flow that leave the Bair Hugger has to leave the drape somewhere. So we distribute uniformly on that drape edge.
Q. And is that -- is that the calculations when you talked about, you thought about it a lot, that's -- that's the boundary connection?

A. That's regarding the temperature. But the -- the -- regarding the mass loads, it's conserve. Means on a flow -- the air mass flow rate that leave the blower has to come out along the drape because the drape covers everything. That's no assumption.
Q. Okay.
A. The assumption is in the temperature of the edge of the drape.
Q. Okay. Number three, we've already talked about the surgical lamp.
A. Because that was a typo.
Q. Okay.
Oh, by the way, what are your assumptions based upon?
MS. ANDREWS: Do you need this (indicating)?
MR. ASSAAD: I don't need it.
BY MR. ASSAAD:
Q. What are your assumptions based -- you just -- I mean, you base your assumptions on something, correct?
A. About which one? Flow rate or --
Q. About -- about the temperature.
A. The temperature, yeah, I did some estimate

calculation, yes.
Q. Okay. You did calculations?
A. Not a computer; hand calculations.
Q. And they're mathematical calculations?
A. Correct.
Q. And that -- those calculations were based on your education, training and experience?
A. Yes.
MR. GORDON: Object to the form of question.
BY MR. ASSAAD:
Q. And going back to the calculation that you did, you actually saw a setup that was in Santa Monica in September which a registered nurse prepared --
A. Correct.
Q. -- the -- a -- a draping for a patient that was going to go through knee surgery, orthopedic knee surgery, correct?
MR. GORDON: Object to the form of the acquisition.
THE WITNESS: She -- the RN did the setup. We asked her: "Do the setup as you usually do." And we waited outside until she did it, and she told us: "Come in."

Page 250

BY MR. ASSAAD:
Q. Okay. Well, was it -- RN, you mean registered nurse, correct?
A. Correct.
Q. A registered nurse, okay.
A. Yes.
Q. Who had experience in setting up --
A. She works -- she works in that surgery -- that's her job.
Q. Okay. And you have no reason to believe that she doesn't know what she was doing when she set up the --
A. No.
Q. Okay. And that's when you took measurements, correct?
A. Correct.
Q. And -- and you turned on the Bair Hugger machine?
A. Correct.
Q. Okay. And you went around the machine and felt where air was coming from?
MR. GORDON: Object to the form of the question.
THE WITNESS: We asked the patient, the volunteer patient, and she said, "If the air was

Page 251

coming to my neck, I have contact lenses and it would bother me; I would have told you." She said, "There was no air coming to my face."
BY MR. ASSAAD:
Q. Okay.
A. And we looked everywhere and -- yeah.
Q. Number four -- I'm going to skip number three because we already talked about that typo.
A. Yes. Num- --
Q. Hold on.
I'm trying to find out where number four is. My fault. Oh, here we go.
Dr. Abraham states, "He claims to present information along two precisely located planes that pass through the roof, but, in fact, his results do not correspond to his purported location." You corrected that today with --
A. That's a typo.
Q. Okay.
A. It was a plus and it says minus or vice versa.
Q. And these typos have no effect on your conclusion?
A. This is only for typing the report.
Q. Okay.

Page 252

A. Yeah.
Q. It has no effect on your calculations or --
A. No.
Q. -- your conclusions?
A. No, no, no, no.
Q. Okay. His criticism, number five --
A. We discussed.
Q. Okay.
MS. ANDREWS: 5.1.
BY MR. ASSAAD:
Q. "His treatment of skin cells as spheres not only has a mathematical error but is based --"
[Reporters asks counsel to slow down when reading.]
BY MR. ASSAAD:
Q. "His treatment of" --
MR. ASSAAD: How much time do we have left?
THE VIDEOGRAPHER: About six minutes.
BY MR. ASSAAD:
Q. Okay. "His treatment of skin cells as spheres not only has a mathematical error, but is based upon a faulty premise."
A. So I can explain.

Page 253

So the faulty premise is how to make a flake move like a sphere, and I already answered that. The second one was about the area, if -- if the area is correct because when you have a flat flake, the drag is called viscous drag. You use the same area. If the flake is normal to the floor, it's called form of drag. You use the same area.
[Reporter requests clarification.]
THE WITNESS: F-O-R-M, form of drag.
BY MR. ASSAAD:
Q. He writes in red, "The mean that -- this means that the disk is oriented perpendicular to the direction of motion."
A. Yes.
Q. And then he circled, says, "Flow parallel to circular disk." And he says "Inconsistent assumptions."
A. He's wrong.
Q. Why is he wrong?
A. Because the area is the same. He's just -- I made a -- yeah, I made a sketch. If you have a disk flying parallel to the table, the area used in the surface viscous direct, if the disk become perpendicular to the flow, it's called formal drag. The same area. Just look at undergraduate

book. It's Munson's. It's written somewhere.
Q. Okay.
A. It's a valid fact. It's not --
Q. So it's something you can find in an undergraduate book?
A. It is already. I -- I mentioned it. Munson book, on page -- it's in the report. We said -- in the appendix.
Q. Okay. Well, we won't have to go to it, but...
A. It's a standard undergraduate thing: Viscous drag. Flag. Same area. No change.
Q. Okay. Number six is, he states your "treatment of collisions are perfectly elastic."
A. I already answered that.
Q. Yeah, you already answered that one.
A. Okay.
Q. Now, number seven is about the inlets.
A. Correct.
Q. Okay. I think there was some confusion with defense counsel trying to understand what you were saying, so I want to try to clarify it.
A. Okay.
Q. You're not saying that the vent above the operating room has to be 20 feet high?

A. Never said that.
Q. Okay. And I'm going to lead, I'm going to get an objection here, but I'm just going to get if over with, okay.
You're saying to simulate the situation where the air is coming out of the grille, that in a mathematical model you have to create that duct?
A. It's the most correct way to do it; that anybody else, they don't understand fluid dynamics.
Q. Why would it be incorrect to not do it this way?
A. Because if you uses ANSYS, apparently the other group used ANSYS, it will tell you what do I do on the inlet? They give you choices.
[Reporter requests clarification.]
[Indecipherable cross-talk.]
THE WITNESS: That's okay. And my throat is getting bad.
BY MR. ASSAAD:
Q. I'm almost done, so...
A. They will give you choices.
MS. ZIMMERMAN: We can switch tapes.
MS. ANDREWS: Calm down.
MS. ZIMMERMAN: We'll take a quick break and let the videographer --

MS. ANDREWS: And you probably need to rest your fingers.
Meet me in my office now.
THE WITNESS: This concludes DVD No. 3. We're now going off the video record. The time is 6:12.
(Recess.)
THE VIDEOGRAPHER: We are back on the video record. This is DVD No. 4. The time is 6:20.
BY MR. ASSAAD:
Q. I'd like you to turn to page 27 of --
A. Of this --
Q. -- of Abraham's report. F -- number -- of Exhibit 18.
A. 27.
Q. He writes, "Furthermore, his methodology" -- he's talking about you -- "is not accepted by persons in the field of fluid mechanics as they use unvalidated numerical simulation to match real-world results."
A. Which?
Q. 27 of Abraham's report. Not yours. Abraham.
A. I know, but in 27.
Q. Page 27.

A. I know, but at which line?
Q. Under F8. There's no line numbers.
A. Oh, oh, I see.
MS. ANDREWS: "As discussed."
THE WITNESS: Okay. I see. Let me read it.
MS. ANDREWS: Methodology.
THE WITNESS: I never read that. Okay.
"As discussed in this the section, the plaintiff's expert -- is that me, plaintiff expert?
BY MR. ASSAAD:
Q. Yeah. It's been a long day.
A. -- makes several flawed assumptions and basic errors."
I don't know where. I could not -- yeah, I did not do any errors.
Okay. "His methodology in --
Q. He goes, "Further, his methodology is not accepted by persons in the field of fluid mechanics as they use unvalidated numeric simulation to match real-world results."
Do you see that -- do you see where I read that?
A. Yeah, I read it.
Q. Do you agree with that statement?

A. Of course not. I never read it before. That's -- that's pretty bad.
Q. Let -- let me ask you, are you a member of the National Academy of Engineers?
A. Yes.
Q. What is the National Academy of Engineers?
A. National Academy of Engineering is a independent organization. Has about 2,000 members. It's the highest level of engineering profession in the world, I would say. In the world, yes.
Q. Okay. Do you know whether or not Dr. Abraham's a member of the National Academy of Engineers?
A. I didn't look.
Q. Okay.
A. I don't look at this.
Q. And who was it founded by?
A. President Abraham Lincoln.
Q. Ex- -- go through the story of how the National Academy of Engineers was founded.
A. During the World War -- during the Civil War, in 1865, the president wanted an independent body of scientists and engineers to explain -- give him an opinion on difficult issues that they are not biased and they are not paid by anybody. They --

they don't have an income from government or anything.
Q. And how exclusive is the organization?
A. Well, every year, they nominate 1,000. They select only 50.
Q. 50 out of 1,000?
A. Correct.
Q. Okay. And did you recently win an award in Italy?
A. I did, yeah.
Q. What was the award for?
A. It's International Conference of Multiphase Flow. They give it once every three years to a person who does research in turbulent flows laden with particles or --
[Reporter requests clarification.]
THE WITNESS: Turbulent -- the same word. Laden, L-A-D-E-N, with particles or droplets or bubbles.
BY MR. ASSAAD:
Q. Okay. Are you aware of -- have you read any articles by Dr. Abraham dealing with particle movement in turbulent flow?
A. No, no, I have not.
Q. Have you come across Dr. Abraham in that

specific field of particle movement and -- and turbulent flow?
MR. GORDON: Object to the form of the question.
THE WITNESS: No.
BY MR. ASSAAD:
Q. Do you know Abraham's, who he studied under, Ephraim Sparrow?
A. I -- I know about Professor Sparrow. He's well known.
Q. Okay. What does he focus on? Does he focus on particle movement in turbulent flow?
A. No, no, no.
MR. GORDON: Object to form of the question.
THE WITNESS: He is an expert in heat transfer.
BY MR. ASSAAD:
Q. He's a -- heat transfer?
A. Radiation and heat -- he has a book.
Q. Is heat transfer the same as -- as particle movement in turbulent flow?
A. No.
Q. Okay.
A. Heat transfer is heat transfer and

particle --
Q. Okay.
A. Yeah.
Q. Now, Professor Apte in Stanford --
A. Yes.
Q. -- he was aware of your methodology and the results, correct?
A. Yes.
Q. At any time did he disagree with your methodology or results in this case?
MR. GORDON: Object to the form of the question.
MR. ASSAAD: Basis?
THE WITNESS: No.
MR. GORDON: You're calling for a -- an outside opinion of -- A, it's leading, but you're calling -- you're -- you're -- it's a foundation objection as well.
MR. ASSAAD: Well -- well, your expert said that his methodology is not accepted by persons in the field of fluid of mechanics. I mean, you guys set this up.
BY MR. ASSAAD:
Q. So is -- is Dr. Apte an expert in fluid meta- -- mechanics?

Page 262

A. Yes.
Q. Okay.
A. He's at Stanford, yeah.
Q. And you had -- you met with him, correct?
A. We always meet, yeah.
Q. Okay. And if he had a problem with your methodology, he would tell you, correct?
MR. GORDON: Object to the form of the question.
BY MR. ASSAAD:
Q. Well, did he ever tell you he had a problem with your methodology?
A. What?
Q. Did he ever say to you in your meetings when you -- when you -- when you hired his grad students --
A. Right.
Q. -- that your methodology is not accepted among -- among the -- the fluid mechanics experts?
A. No. No.
Q. Okay. And you've worked together before with Dr. Apte?
A. Not really. I met him many times in conferences and presentations, but I have not worked with him personally.

Page 263

Q. And what conferences would you -- were you referring to?
A. American Physical Society of Fluid Dynamics.
Q. Okay. Have you ever seen Dr. Abraham at any of these societies?
A. No, but the -- the conference is quite big. I do not know what -- yeah.
Q. All right. Do you keep up to date with all the -- the journals and articles dealing with particle flow in turbulent environments?
MR. GORDON: Object to the form of the question.
THE WITNESS: Well, I review many of them, so I -- I read -- I review for the leading journals.
BY MR. ASSAAD:
Q. Okay. Have you ever come across an article on -- on particle movement ever written by Dr. Abraham in turbulent flow?
A. No.
Q. Okay. Before today, before this case, have you ever heard of Dr. Abraham?
A. No.
Q. Okay. Based on your review of the 3M videos and a little bit of the pictures in this

Page 264

report, do you know whether or not Dr. Abraham used -- or -- or solved for the particle movement through the operating room environment, or did he do something else?
MR. GORDON: Object to the form of the question.
THE WITNESS: I -- all I see in the report of Dr. Abraham is the fluid particle -- fluid particle -- like motion or, like, tracing of fluid points.
BY MR. ASSAAD:
Q. Okay. What's the difference between tracing of fluid points that Dr. Abraham did and what you did?
A. Okay. If you sprinkle some power in a turbulent flow, these particles do not follow the flow.
Q. Wait. Let -- let me understand. Are you saying particles don't follow air flow?
A. Do not follow the local air flow.
Q. Okay. What do you mean by that?
A. Because particles -- particle motion is controlled by drag, lift, added mass, many other terms, plus buoyant -- plus gravity term. If you neglect all these terms, you would be assuming that

Page 265

the particle follow the fluid. They don't.
Q. Okay. In real life scenarios on stuff that you've worked on in the past --
A. Yes.
Q. -- does particle follow air flow?
A. Only if the particle is 1 micron.
Q. Okay.
A. Not 25 or not 20 or 10.
Q. Okay.
A. For that density.
Q. Okay. Go ahead.
A. The density of the squames is like water.
Q. Okay. Are you familiar with the Boussinesq approach that was used by Dr. Abraham?
A. Yes.
Q. Okay. Is -- as a -- as a person who's an expert in the field of -- of particle movement in turbulent flow -- let's back up further one second. Okay.
Does a laminar diffuser -- is the flow in an operating room laminar or turbulent?
A. Turbulent.
Q. Why is it turbulence?
A. Reynolds' number is about 10,000.
[Reporter requests clarification.]

THE WITNESS: Reynolds. Yes.
BY MR. ASSAAD:
Q. So as a expert in fluid flow, would you consider any operating room have true laminar flow?
A. Never.
Q. Okay. You have done -- in your CFD analysis, does the -- when the Bair Hugger's turned on, does it increase the intensity of the turbulence around the operating room table?
A. Correct. The intensity increases because the rising plume interacts with the ambient air, creates a sheer layer, and therefore, the intensity turbokinetic energy increases.
Q. Okay. This -- the calculation that you've done is -- is basically -- turbulence is very important to the -- to the -- solving this problem?
A. Definitely.
Q. Why is turbulence important?
A. Because turbulence increases dispersion of particles and dis- -- and diffusion of any scaler, like heat or any species. Turbulent is a good mixer.
Q. So turbulent means mixing?
A. Absolutely.
Q. Okay. Now, Dr. Abraham used something

called the Boussinesq approach.
A. Yes.
Q. Are you familiar with the Boussinesq approach?
A. Yes.
Q. Okay. How does the Boussinesq -- does the Bouss- -- would a -- the Boussinesq approach be the correct approach in a problem such as this?
A. No.
Q. Why not?
A. Boussinesq approach considered the density of the air or the fluid to be uniform, constant everywhere except for the buoyancy term, which appears in the Navier-Stokes equation. And, therefore, the nonlinear terms in Navier-Stokes equation will not have the influence of density variation.
[Reporter requests clarification.]
THE WITNESS: Density variation.
BY MR. ASSAAD:
Q. In -- in a situation like this, how important is density variation?
A. It's crucial, because you have a heating source, whether it's a lamp or the air -- Bair Hugger, or the heads of people, any temperature

variation --
[Reporter requests clarification.]
THE WITNESS: Temperature variation, the temperature everywhere is not uniform. It varies in time and space. And, therefore, we have to account for the local variation of density in order to have a correct solution -- or reliable solution.
BY MS. ANDREWS:
Q. Because the partic- -- the density of the air will have an effect on the particle?
A. Definitely. Dispersion.
Q. And by using the Boussinesq approach, you -- you take away that force on the particle by removing density?
MR. GORDON: Object to the form of the question.
THE WITNESS: Well, you change -- you are not solving the correct equation. That's what it is.
BY MR. ASSAAD:
Q. Okay. How does using the Boussinesq approach, how would that affect the calculations that -- that are needed to calculate the particle movements in an operating room?
A. It's a -- a general question, and I -- I

just say, basically, you must use correct equations for a given flow, and Boussinesq is not the right one for this flow.
Q. What would Boussinesq be the appropriate flow equation for?
A. For -- if you have a -- a room like this with no air conditioning and you have a heat source like a lamp or a candle, that would be a good -- it's a --
[Reporter requests clarification.]
THE WITNESS: Good approximation.
Basically, Boussinesq approximation is correct for natural convection. Natural convection means no electric motor, blower or anything.
BY MR. ASSAAD:
Q. So with an operating room that has a lot of flow coming in from the ceiling --
A. Right, right.
Q. -- the -- the Boussinesq approach would not be an accurate --
A. Be- -- not because of the air coming from the ceiling. Because there are temperature variation in the room for --
[Reporter requests clarification.]
MR. ASSAAD: Temperature variations.

Page 270

THE WITNESS: Variation in the room at different locations because people, lamps, blower, these are sources distributed. It is not a quiet and ambient surroundings.
BY MR. ASSAAD:
Q. Okay.
THE REPORTER: Counsel...
MS. ANDREWS: Yes?
THE REPORTER: Here.
MS. ANDREWS: Thanks. I'm out of gas. Thank you.
BY MR. ASSAAD:
Q. You've never been an expert witness before on the litigation, have you?
A. Thank God.
Q. Is there a reason why you got involved in this case?
A. I think they told me in the first week or so that this involves patients who are suffering or something like that. I don't know the details.
Q. Uh-huh.
A. So just trying to help; that's all.
Q. Okay. And there -- there were -- there were questions raised out to you about whether or not you reached out to the FDA or the CDC or

Page 271

anywhere else. Do you remember those questions?
A. I do.
Q. You -- you've signed a protective order in this case, correct?
A. Correct.
Q. Okay. So a lot of the information that you have you can't share with -- with the public, correct?
A. Correct.
Q. Okay. And you agree that patients' lives matter?
A. Definitely.
Q. And the safety of patients matter, correct?
A. Yes.
Q. Okay. In effect, you've worked with, I think, the NIH to do research on sleep apnea, correct?
A. Correct.
Q. Let -- let -- and that used DNS, correct?
A. Yes.
Q. Okay. And that's when you would -- you would send a camera down the -- the tracheal tube?
A. Yes.
Q. And -- and create a image of -- of the --

Page 272

of the trach and -- and the -- and the --
A. The whole -- the 3D geometry of the airway.
Q. And you'd use the CFD to how -- how to fix the sleep apnea, correct?
A. Correct.
Q. And what was the -- what was the success rate on the work that you did on the patients that they did?
[Reporter requests clarification.]
BY MR. ASSAAD:
Q. The success rate on the patients that you -- that you did the CFD for and the resolution of sleep apnea?
A. Okay. The -- I don't know many patients does this, but in critical operations, they would need something like this because the surgeon doesn't know where the blockage is. So you have to be -- you have to be very accurate in direct simulations to get the right blockage before the operation.
Q. And you would show them where the blockage was with the CFD, correct?
A. Correct, correct, correct.
Q. And they would go operate on -- on the patient, correct?

Page 273

A. Right, but not many. Just very critical cases.
Q. And out of those critical cases, was -- what was the success rate to -- to resolve the sleep apnea?
A. Well, it just -- as -- as we predicted, yes.
Q. Well, was it 100 percent success?
A. Right, but I don't know how many. I mean, yeah.
Q. Okay. You've offered many opinions in this case in your report, correct?
A. Correct.
Q. And you stand by your report?
A. Definitely.
Q. And -- and your -- your opinions are held to a reasonable degree of engineering certainty, correct?
A. What I did is -- as far as I know, is very accurate.
Q. Okay. And you stand by your opinions?
A. Yes.
Q. And, in fact, you've actually submitted your report for publication, correct?
A. I did.

Q. Okay. To a peer-reviewed journal, correct?
A. Yes.
Q. Okay. And by the way, you've just received in the past couple weeks the reports of Abraham -- Dr. Abraham, Dr. Kuehn and Gary Settles, correct?
A. But I -- I did not read all of them.
Q. Okay.
A. I just read parts of Dr. Abraham.
Q. You received it about two weeks ago, correct?
A. Right, but I -- I was --
Q. Okay.
A. -- busy, so...
Q. Right. Give me a minute.
This is more of a legal term. We use a term reasonable degree of engineering certainty.
A. Okay.
Q. Okay. Do you understand what that means?
A. I think I was told it's 99 percent or something like that.
Q. It's over 50 percent.
A. Okay.
Q. When I say do you stand by your opinions,

do you believe -- or do you have -- strike that.
You believe your opinions are accurate, correct?
A. Based on the results, yes.
Q. And based your education, training and experience and the -- the code they use, correct?
A. Yes.
Q. Do you stand by your results and do you believe that when we use the term of reasonable degree of prob- -- of engineering certainty, we -- it is a -- let me back up. Okay.
What level of certainty do you believe that your results and opinions are on a scale from 1 to 100?
A. 99 -- I mean, yes, that's good.
MS. ANDREWS: Let me just ask for a record, clarification, she wrote 90, dash, 99 percent.
THE WITNESS: 99 percent.
BY MR. ASSAAD:
Q. 99 percent, okay.
MS. ANDREWS: You said 99 percent?
THE WITNESS: Yes, right.
BY MR. ASSAAD:
Q. A couple more questions.

A. Okay.
Q. Not because it's just late, but I just love talking to you about engineering stuff --
A. Okay.
Q. -- and it's very interesting.
A. Okay.
Q. The -- the Boussinesq model, what -- you say that's the incorrect approach, correct?
A. For this flow.
Q. Okay. What is the correct approach?
A. To solve the complete Navier-Stokes equation, which we did.
Q. And that's using Legrange?
A. Well, Legrange is only for the particles.
Q. Okay.
A. So you have to follow the particle trajectories.
Q. Oh, so is the Boussinesq doesn't deal with the particles; it just deals with --
A. Yeah, but fluid only.
Q. Only fluid, okay.
A. Correct, correct, correct.
Q. All right.
Okay. Do -- do you see anywhere in page 5 of Abraham's report --

A. Yes... Which --
Q. Do you see anywhere in his report that indicates what type of model or calculations he did to calculate particle -- the particle movement?
A. I didn't read this, but I can see. Usually it will show an equation for particles and how many particles and I don't see it.
Q. Do you see any equations in his report?
A. I didn't read, but I can look.
Q. So for all we know, he might not even have used the Navier-Stokes equations, correct?
MR. GORDON: Object to the form of the question.
THE WITNESS: I -- I -- any CFD will have to use --
[Reporter requests clarification.]
THE WITNESS: Any CFD -- Charlie, Frank, David -- will use Navier-Stokes, yeah.
BY MR. ASSAAD:
Q. Does it mention here what -- what code he used? Do you see that anywhere?
A. Somewhere I -- I see ANSYS, but I -- I cannot locate it. I haven't read --
Q. I don't think it's here. I think we just assumed it based on the picture.

A. Maybe.
MR. GORDON: If that was a question, then I object to it.
MR. ASSAAD: Excuse me?
MR. GORDON: If that was a question --
MS. ANDREWS: Ask a new question.
MR. GORDON: -- I don't know --
BY MR. ASSAAD:
Q. So you would agree with me that, sitting here today, looking at Dr. Abraham's report, someone such as yourself, who is -- in a fluid -- a fluid dynamics expert, could not decipher the methodology --
A. Correct.
Q. -- that Dr. Abraham used?
A. Correct.
MR. GORDON: Object to the form of the question.
BY MR. ASSAAD:
Q. Okay. Do you know what methodology Dr. Abraham used, looking at his report?
A. No.
Q. Okay. Do you know whether or not he used squames or cell -- or spheres?
A. No.

Q. Okay. Do you know whether or not he used Legrange principles or Euler principles?
A. No, because that would involve particle --
[Reporter requests clarification.]
THE WITNESS: That would involve particles.
BY MR. ASSAAD:
Q. Okay. So it looks like these dotted lines are just air streams, correct?
A. I think --
MR. GORDON: Object to the form of the question.
MS. ANDREWS: Page...
MR. ASSAAD: Page 7 and 6.
THE WITNESS: Right. These look like some -- it's trajectories of something, but it's not -- it's probably points from ANSYS or Fluent.
BY MR. ASSAAD:
Q. Okay.
A. I'm not sure.
Q. Do you know whether or not, based on the report, that Dr. Abraham calculated the turbulent -- turbulent intensity anywhere in the operating room?
A. I cannot say because there are no equations written.

Q. Do you see any type of turbulent flow shown in any of these pictures that you've seen?
A. It could be -- these color pictures could be anything.
Q. Okay.
A. I'm just assuming these are trajectories of points or something.
Q. Okay.
MR. ASSAAD: I have no further questions, but Dr. Elghobashi reserves the right to -- first, he'll read and sign and have an opportunity to read Dr. Abraham's deposition and the right to rebut down the road at trial or Daubert.
[Reporter requests clarification.]
MR. ASSAAD: Daubert motions.
MR. THORNTON: Just put his hourly rate on the record.
MR. ASSAAD: Huh?
MR. THORNTON: His hourly rate for deposition.
MR. ASSAAD: Oh, you want that on the record?
MS. ZIMMERMAN: Yeah. I don't think we said the --
MR. ASSAAD: I don't --

BY MR. ASSAAD:
Q. Dr. Elghobashi, your hourly rate is $800 an hour?
A. Only for consulting. Not for deposition.
Q. Okay. What's it for -- what is it for deposition?
A. 1500 an hour or 10,000 a day.
Q. Okay.
MR. ASSAAD: That's all I have.
MR. GORDON: I just have a couple in the interest of time. No, no, no. Just keep that. I don't want to use that mic.
FURTHER EXAMINATION
BY MR. GORDON:
Q. In your -- in your expert report, Doctor, do you say anywhere that your deposition rate was what you just said?
A. Nobody asked me before. Nobody. I just -- they asked me what is your consulting rate for this group here, and I did 800, yes.
Q. Okay. And this is your first deposition ever, right?
A. Ever.
Q. So how did you come up with a rate of $1500 an hour or $10,000 a day?

A. I asked people who did depositions and, yeah -- I -- before.
Q. When?
A. A few weeks ago.
Q. Okay. Mr. Assaad asked you a few minutes ago about you having signed a confidentiality order. Do you remember that?
A. I did.
Q. And that was -- he asked you that in the context of questions about saying something or sharing anything with the FDA.
A. Correct.
Q. Do you remember?
A. Yeah.
Q. Did -- did you think that the confidentiality order prohibited you from sharing anything with the FDA?
A. No. We --
MS. ANDREWS: Objection. Calls for speculation.
THE WITNESS: We have --
MR. GORDON: Wait, wait. How many lawyers are -- are handling this case now?
MS. ANDREWS: That's a good question. How many experts?

MR. GORDON: No, no.
MR. ASSAAD: I'll handle it.
MR. GORDON: Mr. Assaad handled the -- the examination.
MS. ANDREWS: I don't think --
MR. GORDON: You don't --
MS. ANDREWS: I don't think any --
MR. GORDON: You don't now get to --
MS. ANDREWS: I don't think --
MR. GORDON: -- now jump in and --
MS. ANDREWS: -- that you have the rules correct, but if Mr. Assaad would like to make objections --
MR. GORDON: Really? So if we send three or four lawyers.
MS. ANDREWS: If you prefer him...
THE REPORTER: Please, one at a time. It's way too late for this.
MR. ASSAAD: It is. I'll han- -- just...
MR. GORDON: I just want to know: Are plaintiffs taking the position now that if we send more than one lawyer to a deposition, both will -- two or more lawyers get to --
MS. ANDREWS: Counsel.
MR. ASSAAD: She's presenting and I -- I'm

handling the --
MS. ANDREWS: I presented him with this.
MR. ASSAAD: -- science part.
THE REPORTER: One at a time, please.
THE WITNESS: Yeah, she cannot do it.
MR. ASSAAD: I can handle it. I don't think it's a big deal to -- to let her present it.
MS. ANDREWS: It's a big deal to him.
MR. ASSAAD: Yeah.
MS. ANDREWS: So I stand on the fact that one lawyer in a multidistrict litigation within a protocol that is not clearly described in the order by this court may defend only one objection at a time. One counsel at a time. I'm one person. I made one objection. There were not numerous objections.
If you'd like to ask another question, we're happy to have the witness answer it.
Go ahead.
MR. GORDON: Okay. Could you read the question back, please.
(Record read as follows:
"Q. Did you think that the confidentiality order prohibited you from sharing anything with the FDA?")

MS. ANDREWS: Objection. Form.
THE WITNESS: I -- I never spoke to anybody outside this group about this project. When I asked people about the rate --
MS. ANDREWS: That's -- you've answered the question, Doctor.
THE WITNESS: Oh, sure, okay.
BY MR. GORDON:
Q. But you said you submitted this to a -- a journal for publication?
A. Right.
Q. That's outside of this litigation, right?
MS. ANDREWS: Objection. Form.
You can answer.
THE WITNESS: We submitted for publications, but it's all now confidential between the editor and the reviewers.
BY MR. GORDON:
Q. Who's we who submitted it for publication?
A. I did.
Q. Anybody else besides yourself?
A. The Dr. Apte.
Q. Okay. What journal did you submit it to?
MS. ANDREWS: Objection.
THE WITNESS: I cannot do that. It's

confidential.
BY MR. GORDON:
Q. Confidential under what?
MS. ANDREWS: Counsel, the rules of submitting treatises for publication are well-known in the academic community. I can certainly let you know that he cannot talk about a pending publication. Ask any of your experts, which we will not ask them about. It has not been published. It is now going through the peer review process, which is sacred --
[Reporter requests clarification.]
MS. ANDREWS: It is going through the peer review process --
THE WITNESS: Peer review.
MS. ANDREWS: -- which is sacred, and will not be the subject of questioning today and he will not be allowed to discuss it, so said -- so says the witness to us and to everyone in this case.
MR. GORDON: Okay. This is a federal court proceeding. We are entitled to his testimony under oath, unless you are objecting on a basis of a recognized legal privilege. I'm not aware of an attorney-client privilege, a peace-priest-penitent privilege, or anything else that would apply to

submission to a journal. Maybe you're aware of some case law that says submission to a journal confers a privilege such that it precludes testimony, but I want to make it very clear that we are going to ask the Court to order Dr. Elghobashi to answer the question, what journal did he submit this to, and the follow-up questions to that would be when and what communication he's had on that.
If you're saying that you're not -- you're instructing him not to answer on whatever basis it is you -- you are doing so, that's -- that's your prerogative and we'll take it up with the Court.
MS. ANDREWS: Counsel, I'm invoking, on behalf of Dr. Elghobashi, and the peer-reviewed -- academic peer-reviewed literature in the academic community, a document that's been upheld in Federal Court known as the Ingelfinger rule. It's well-known. He cannot talk about it. We are not allowed to ask about it. And the journals themselves may not discuss it. Any peer-reviewed literature process is private and it is not the province of this man's academic work and intrusion into his work at this point.
If you need to pursue a court order, I would meet and confer with you about it as long as

we can maintain the confidentiality, but we're refusing to answer the question today.
MR. GORDON: Well, you -- you recognize that there is a protective order in this case and if he were to testify about this journal, you could designate that testimony confidential under the protective order.
You're aware of that, aren't you, Counsel?
MS. ANDREWS: It doesn't have anything to do with this litigation. It is outside of it. It is an academic process that has a completely different set of rules that have been repeatedly upheld by the courts, and we are going to observe that today. If we want to meet and confer about it and get further -- have further discussion, but not today.
MR. GORDON: Okay.
BY MR. GORDON:
Q. When did you submit your publication or submit your expert report for publication?
A. Probably four weeks ago.
Q. Okay. Were you encouraged to do so by plaintiff's counsel?
A. Never, never.
Q. Did you even advise them that you were

going do that?
MR. ASSAAD: Objection. Sorry. Communication.
MS. ANDREWS: You can answer.
THE WITNESS: I asked them whether it's okay. I made it only -- not for myself. I made it for the students who did the work. I don't need that paper. I did it only for the poor students who worked for four or five months. That is the only reason. It's not to tell people about it or --
MS. ANDREWS: I think you've answered the question, Doctor.
THE WITNESS: Yeah, yeah. Okay.
BY MR. GORDON:
Q. Earlier you said that the -- that the CFD model that you use is validated every year?
A. Correct.
Q. Why? It's already been validated, right?
A. No. Each year you have different physics. Like in first, will be isothermal flow. Next year, you add particle. Next year, you add vaporation. Next year, you add chemical reaction. Each step, as I said earlier many times, it has to be validated. You mentioned airplane, when you change something. That's the same thing. Every time you put new

physics, you have to validate it again. So now it's a validate for so many pieces of the puzzle.

Q. I'm -- what do you mean by new physics of an airplane?

A. Okay. You were sitting here and you said if you have an airplane flying and then you make a change, you have to do something to the -- to the education of the pilots or something. You said that here today. When I said it's like a plane, I mentioned a plane has been tested for four years, then they allow passengers to use. And you said --

[Reporter requests clarification.]

THE WITNESS: Then you can allow passengers to use it. And you said but if a plane has been flying and then you make a modification, you have to test it. I don't remember what you said, but it should be in the record here. So I'm saying now the code has been running for isothermal flows, you test it. Another student comes, you do it for particles; you test it again because you have new physics.

So the jet engine test has all the physics he can think of, compressible, particles, vaporization, heat transfer --

[Reporter requests clarification.]

THE WITNESS: -- chemical reaction, and unsteady and swirl -- unsteady and swirl. There are no more complications than this.

BY MR. GORDON:

Q. And did you say the Pratt & Whitney used this CFD model --

A. Correct.

Q. -- to design --

A. Correct.

Q. -- let me finish -- design jet engines?

A. Yes.

Q. Okay. But they still measure velocity and temperature, right?

A. Yes. You always measure for airplane. You measure parts, but they use it to get to the 99 percent. Yes.

MR. GORDON: Nothing further.

MS. ANDREWS: Do you guys have a stipulation or are you --

MR. ASSAAD: Thank you.

MS. ANDREWS: Do you have a stipulation?

MR. ASSAAD: No.

MS. ANDREWS: No? No stipulation. Okay.

MR. ASSAAD: Okay.

THE VIDEOGRAPHER: This concludes the

video -- this concludes the videotaped deposition. We're now going off the video record. The time is 6:57.

(Whereupon, the deposition adjourned at 6:57 p.m.)

-oOo-

I, Witness , do hereby declare under penalty of perjury that I have read the foregoing transcript; that I have made any corrections as appear noted, in ink, initialed by me, or attached hereto; that my testimony as contained herein, as corrected, is true and correct.

Executed this _____ day of _____, 20____, at _____, _____.

(City) (State)

_____

Witness

Volume

STATE OF CALIFORNIA)
) ss.
COUNTY OF LOS ANGELES)

I, Elizabeth Borrelli, Certified Shorthand Reporter, Certificate No. 7844, for the State of California, hereby certify:

I am the deposition officer that stenographically recorded the testimony in the foregoing deposition;

Prior to being examined the deponent was first duly sworn by me;

The foregoing transcript is a true record of the testimony given;

Before completion of the deposition, review of the transcript [ ] was [X] was not requested. If requested, any changes made by the deponent (and provided to the reporter) during the period allowed are appended hereto.

Dated: 6-20-2017

_____
ELIZABETH BORRELLI, CSR 7844

NAME OF CASE: In Re: Bair Hugger Forced Air Warming Products Liability Litigation
DATE OF DEPOSITION: Thursday, June 15, 2017
NAME OF WITNESS: Said Elghobashi
Reason Codes:

1. To clarify the record.
2. To conform to the facts.
3. To correct transcription errors.

Page _____ Line _____ Reason _____
From _____ to _____
Page _____ Line _____ Reason _____
From _____ to _____
Page _____ Line _____ Reason _____
From _____ to _____
Page _____ Line _____ Reason _____
From _____ to _____
Page _____ Line _____ Reason _____
From _____ to _____
Page _____ Line _____ Reason _____
From _____ to _____
Page _____ Line _____ Reason _____
From _____ to _____

_____